

In This Issue—Complete Valve Timing Data

# MOTOR AGE

Vol. XLV  
Number 26

PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE  
CHICAGO, JUNE 26, 1924

Thirty-five Cents a Copy  
Three Dollars a Year

**I**T must be interesting to dealers who know the great luxury of mental activity, to note that Jordan production, sales, service, dealers' profits and owners' satisfaction have been gradually increased in a conservative, business like way in each succeeding year since Jordan first took its place in the field.

*Edward S. Jordan*

President  
Jordan Motor Car Company  
Cleveland, Ohio

# BLACK & DECKER HALF-INCH SPECIAL PORTABLE ELECTRIC DRILL

*"With the Pistol Grip and Trigger Switch"*



*Now*  
**\$58**

## PREFERRED BY MEN WHO KNOW

In a recent investigation in 10 states only three of the automotive repair men asked expressed a preference for any other make of electric drill.

This means more than anything we could say.

Carried in stock by leading Automotive Jobbers

**THE BLACK & DECKER MFG. CO.**

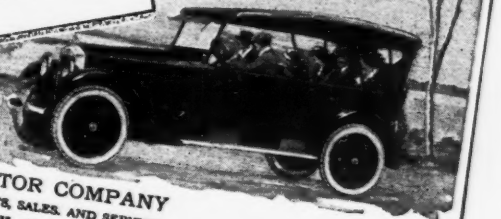
**TOWSON, MD.**

*Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.*

BACKGROUND PAT. 1924  
B & D. MFG. CO.



**"Increased  
our repair  
business  
200%"**



**RAINER MOTOR COMPANY**  
ACCESSORIES, PARTS, SALES, AND SERVICE  
TROY, ALA.

Weaver Mfg. Company  
Springfield, Illinois.

May 15th., 1924.

Gentlemen:-

Just a voluntary word of praise for the  
"WEAVER AUTO CRANE"

We purchased one of your two ton cranes last August and mounted same on a Big Six Studebaker chassis (six years old) and have yet to find our first job that would stall us. This equipment to some garagemen might seem not only a trifle expensive in its original cost, and perhaps unnecessary for their use, however from our experience we would be able to keep shop without it. We have made more than enough clean money from its service to take care of cost of the crane plus the Studebaker Chassis which we figured cost us \$550.00 and in addition to this, the advertising which we received by having this up-to-date wrecker service increased our repair business 200%.

Our advice to any garage who are now operating without this equipment is to purchase one at once and put it in use immediately. It will ring the register twenty-six days out of every month if you go after it.

Yours very truly,  
Rainer Motor Co., Inc

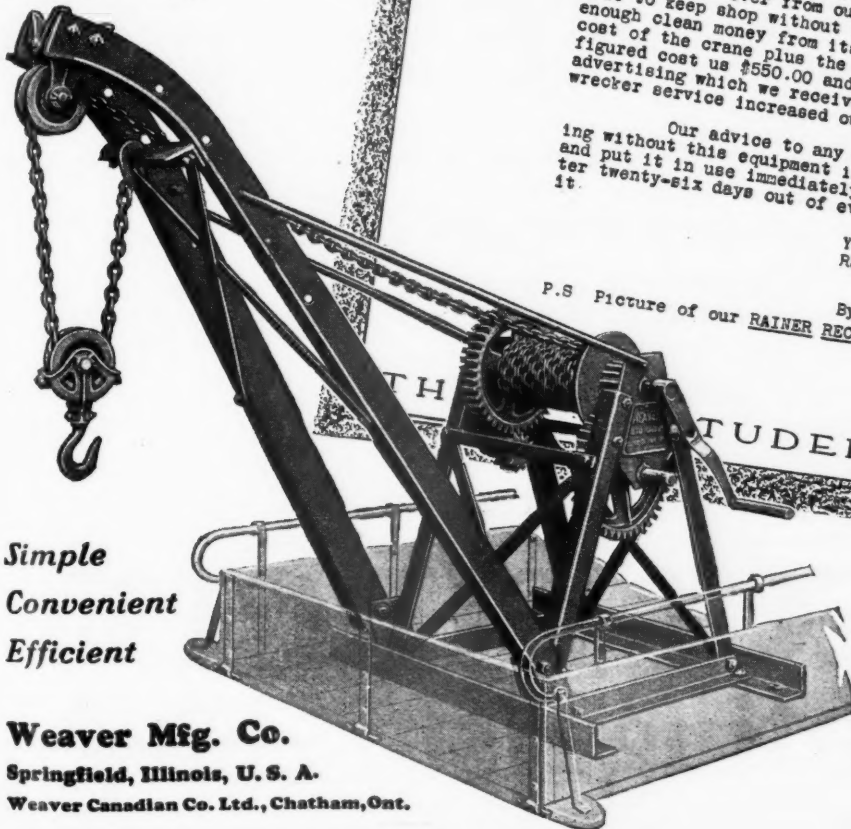
By C. F. Fitch Sect'y

P.S. Picture of our **RAINER RECKER** inclosed.

STUDEBAKER YEAR

**T**HE Rainer Company is only one of thousands of shops which are using Weaver Auto Cranes to make a worth while profit on towing work, bring more repair business into the shop and attract new customers. What the Weaver Auto Crane is doing for them it will do for you.

Right now is the season when you can make maximum profits with a Weaver Crane. Ask your jobber for details. Do it today.



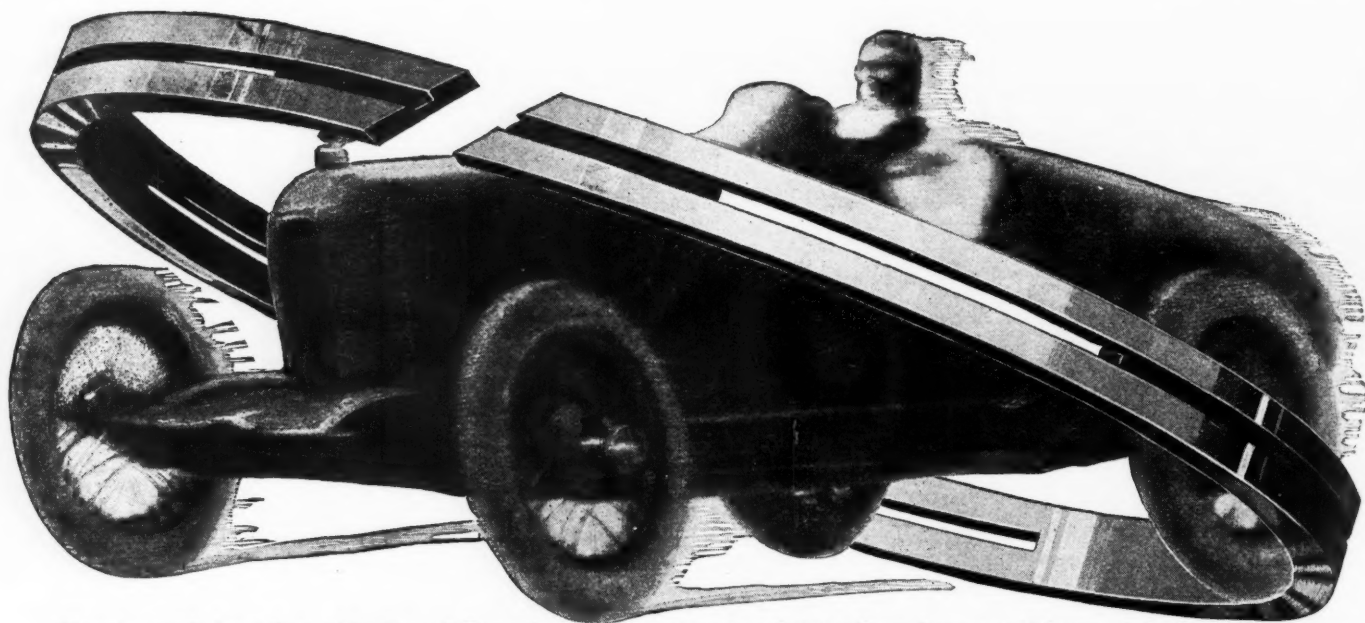
**Simple  
Convenient  
Efficient**

**Weaver Mfg. Co.**

Springfield, Illinois, U. S. A.

Weaver Canadian Co. Ltd., Chatham, Ont.

**WEAVER  
Auto Crane**



(Drawing made from photo of Joe Boyer in Duesenberg traveling approximately 120 miles an hour on straight-away in Indianapolis race.)

# AGAIN— PERFECT CIRCLES *Win at Indianapolis*

ALL ten cars that finished in the money in the Indianapolis 500-mile race were equipped with PERFECT CIRCLE Oil-Regulating piston rings.

And the spectacular victory of the Duesenberg, driven by Boyer and Corum at 98.24 miles an hour, was the *third successive victory* won on the Indianapolis track by cars equipped with PERFECT CIRCLE Oil-Regulating rings. Murphy won with them in 1922, and Milton, in 1923.

*Since Jimmy Murphy won the Indianapolis race in 1922, every major race event in the United States has been won by a car equipped with PERFECT CIRCLE Oil-Regulating rings.*

Such consistent use by the foremost racing drivers and designers is proof of the superiority of the PERFECT CIRCLE principle of oil-regulation, and of PERFECT CIRCLE workmanship.

These same qualities have led 50 manufacturers to adopt PERFECT CIRCLE Oil-Regulating rings as standard equipment—and are making them the most profitable replacement ring for jobbers and garagemen.



OIL REGULATING TYPE, \$1.00 EACH  
One to a piston  
Up to and including 5 in. diameter  
COMPRESSION TYPE, 25c and up

Indiana Piston Ring Company, Hagerstown, Indiana

Harkrader & Harkrader: Western Sales Agents 1603 S. Michigan Ave., Chicago

# PERFECT CIRCLE Oil-Regulating Piston Rings

# MOTOR AGE

Reg. U. S. Pat. Off.  
Published Every Thursday by

THE CLASS JOURNAL COMPANY

5 So. Wabash Ave.  
Chicago, Ills., U. S. A.

Vol. XLV

Chicago, June 26, 1924

No. 26

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### SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada .....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies .....	35 cents

Subscriptions accepted only from the Automotive Trade  
Entered as Second Class Matter Sept. 19, 1899, at the Post Office  
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# Get a Manley

## GARAGE LIGHT

**Faster Work  
Better Work  
More Accomplished  
Fewer Headaches**

Adjustable to every required position — throws the light up, down, or sideways, under the hood or under the chassis or in the car.

Just what you need for the wash rack.

Has extra socket to furnish current for electric tools.

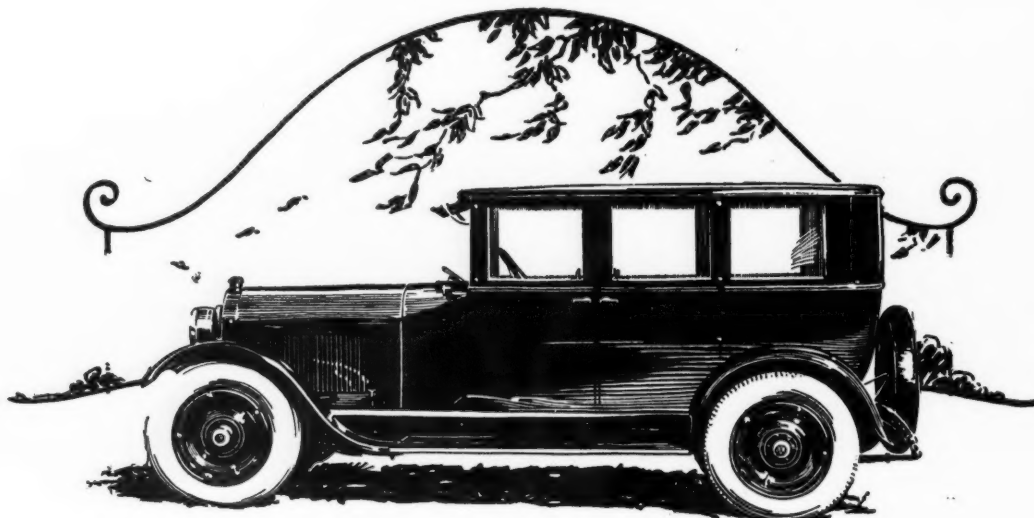
*Your jobber  
has them*

*For Complete Bulletin  
write to*

## MANLEY MFG. CO.

York, Pa.





## *Repeat Orders*

*—and how to get them*

How much more stable a retail business is if it has a steady clientele to depend upon for repeat orders, rather than to be forced continually to "drum up" new trade!

Westcott dealers are singularly fortunate in this respect. Once a man buys a Westcott, he is a Westcott enthusiast during the rest of his motoring life.

There is a logical reason for this. When a Westcott owner finds that his car is good for several years of service after other cars have gone to the junk-heap, it is only natural that he should continue to buy Westcotts.

*The opportunity of allying with Westcott is open to dealers in territories not already under contract? Drop us a postcard for information on this point.*

*B. J. Westcott*  
President

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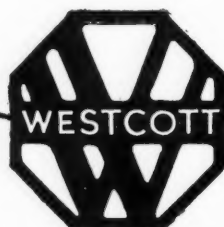
# WESTCOTT

*"The Car with a Longer Life"*

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THE WESTCOTT MOTOR CAR COMPANY

Springfield, Ohio



# Stability is a Powerful Salesman

THE stability of the manufacturer is the deciding influence in the sale of more motor cars today than ever before.

Studebaker has been supplying high-grade transportation for 72 years. The Studebaker business is permanently established. Studebaker is building for the future just as carefully as when the business was launched.

Put this sort of background behind Studebaker's complete line of cars—three distinct models in thirteen body types—and you have another reason why Studebaker dealers so generally control the quality market.

LIGHT-SIX			SPECIAL-SIX			BIG-SIX		
5-Pass. 118-in. W. B. 40 H. P.			5-Pass. 118-in. W. B. 50 H. P.			7-Pass. 126-in. W. B. 60 H. P.		
Touring . . . . .	\$1045		Touring . . . . .	\$1425		Touring . . . . .	\$1750	
Roadster (3-Pass.) . . . .	1025		Roadster (2-Pass.) . . . .	1400		Speedster (5-Pass.) . . . .	1835	
Coupe-Roadster (2-Pass.) . .	1195		Coupe (5-Pass.) . . . .	1895		Coupe (5-Pass.) . . . .	2495	
Coupe (5-Pass.) . . . .	1395		Sedan . . . . .	1985		Sedan . . . . .	2685	
Sedan . . . . .	1485							

(All prices f. o. b. factory)

# Studebaker

South Bend, Indiana

THE WORLD'S LARGEST PRODUCER OF QUALITY AUTOMOBILES

# Oakland Dealers are Cashing in on Big Sales Advantages

## Bear these facts in mind in choosing a car to sell:

Be sure that the engine in the car you sell incorporates the very latest design and construction.

Be sure to choose a car with four-wheel brakes. It's hard to sell a car without this proved essential.

Ordinary body finishes are perishable. Do you know the facts about Oakland's new finish?

Observe whether driving controls are convenient. Compare other cars with Oakland in this respect.

The tendency is toward a more substantial top for open cars. Choose the car you sell with this in mind.

Although disc steel wheels are superior, most builders in this class charge buyers extra for them.

Note the body design and workmanship of cars in this class. Are bodies attractive and substantial?

## Here are the sales advantages Oakland offers:

1 { Oakland's engine is the last word in advanced design. Automotive engineers praise its construction.

2 { The Oakland Six has four-wheel brakes at no added cost. They are sound in principle and practice.

3 { Oakland alone, in its class, has a special new finish which will not check nor lose its lustre.

4 { Oakland's controls—all of them except gear shift—are on the steering wheel; an exclusive feature.

5 { Everyone likes Oakland's permanent top. Curtains fit better and glass enclosures can be added.

6 { All True Blue Oaklands have disc steel wheels at no extra cost. They are better looking and safer.

7 { Oakland's seven distinctive bodies are Fisher-built. Everyone comments on their smart appearance.

The True Blue Oakland is built and priced to be the leading value in its field

OAKLAND MOTOR CAR COMPANY, PONTIAC, MICHIGAN

Roadster . . . \$ 995  
Sport Touring . . 1095  
Sport Roadster . . 1095  
Business Coupe . . 1195

Coupe for Four \$1395  
Sedan . . . . 1445  
Glass Enclosures for Touring Cars \$60—for Roadsters \$40  
All prices f. o. b. factory



True Blue  
Touring Car

\$995<sup>00</sup>  
f. o. b. Factory



# Where Profits Come From— and Where They Go

Motor car dealers are today faced with a problem which many other businesses have faced before. How can we hold our present volume of sales and reduce selling expense—or how can we increase sales without running our selling cost way out of sight?

It must be borne in mind that the selling of motor cars is an infant business—only fifteen or twenty years old. Dealers in other commodities—organizations twenty-five or fifty years old—can point the way to the motor car dealer and help him in this dilemma.

## Look At the Methods of One of Your Suppliers

Suppose, for example, you buy your shop tools from a large progressive mill supply house. How do they sell you? One of their salesmen drops in every month or so and checks over the material you need. If, between calls, some unexpected need crops up, you telephone this salesman, and the goods are delivered to you immediately. That mill supply house makes a fair profit on your business—because it is repeat business—it comes to them without great sales expense. You are sold on their products and their service.

On the other hand, suppose some competitor of this mill supply dealer tries to obtain your business. He calls for some months. Perhaps he obtains a small order now and then. But there is no profit in your orders for this rival mill supply house. It costs too much to sell you.

These same circumstances hold true in the manufacturing business, department stores, hardware stores—and in selling motor cars. It's the repeat business that makes the long profit, lowers selling expense, and pays the cost of getting the *new* business.

## How This Applies to Your Business

As a matter of fact repeat business is not only the most profitable but the easiest for you to obtain. Contrast the small cost of selling the owner who drops into your salesroom and buys, with the cost of hunting up a prospect, calling two or three times and making a demonstration before closing a sale.

It is also easier for you to recondition the used car which your present owners turn in. Your shop

men are perfectly familiar with the car. They know how to put it in better shape than other makes which are turned in.

And it's easier for your men to sell that reconditioned used car because they know it better and because the prospective car owner who wants a used car of the make you sell instinctively comes to you and will pay you a little better price—knowing you will take care of him properly.

Then this buyer of your used car becomes a prospect for a new car and the whole process may be repeated—and you save at each step.

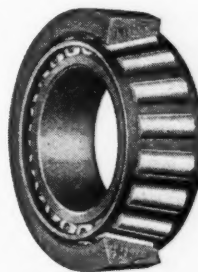
Therefore, we say, it's the repeat business which pays you the better profit and supplies the money to go out and obtain business from the other fellow.

## The Requirements

Obviously to obtain this repeat business you must have a definite advertising and sales plan. Hit and miss methods will not do. But a well worked out, *directed*, sales and advertising effort will prove most profitable.

However, there are two other major requirements: a good car and proper service. Armed with these, a go-getter can obtain repeat business from a very large percentage of his original sales.

Inasmuch as this profitable business is almost wholly dependent on what the manufacturer puts into the car, car parts are of vital interest to the car dealer.



Take, for example, such important units as bearings. The car dealer who is selling a car whose vital units are mounted on Timken Bearings (and most of you are) has not only a sales feature, in obtaining the original sale, but a positive advantage in obtaining repeat business.

Timken Bearings solve many of your service problems by keeping the car on the road and out of the shop—*where profits are lost*. And the owner whose car stays out of the shop is much more likely to come back when he wants a new car. The dealer who sells cars with Timken Bearings built into them is in a much better position to obtain the longer profits. The Timken Roller Bearing Company, Canton, Ohio.

**GENUINE BALLOON  
TIRES, STANDARD ON REO  
PASSENGER CARS, TOGETHER  
WITH THE COMPLETENESS  
OF THE LINE,  
MAKE THE REO FRANCHISE  
MORE VALUABLE  
THAN EVER**

**The Reo Line Today is the Most Complete in the World, Embodying a Product to Fit Every Phase of Motor Transport—Passenger Cars—Speed Wagons—Taxicabs—Passenger Busses—Speed Wagon Parcel Delivery.**

**REO MOTOR CAR COMPANY, Lansing, Mich.**



# MOTOR AGE



*Sales rooms for cars may be found in all degrees of splendor.*

## What Is the Right Kind of Automotive Building?

*The Answer Depends on How Complete a Transportation Store the Dealers Intend to Operate—Some General Principles Laid Down*

BY TOM WILDER

"WHAT kind of building should I have?" is the general query, and the general answer is another question, "What kind of a business have you?" There is probably no other business requiring so much specialization in its housing as the automobile business. Every

branch calls for something different from the others.

This is the age of specialization. Every trade, every profession, every business is specialized. One carpenter is skilled in cabinet work while another handles rough construction work with great speed. One physi-

cian treats only throat disease, one lawyer gains a reputation on divorce cases and prosecutes almost nothing else.

There are today two tendencies at work in the automotive field. One is to specialize in one branch to the exclusion of all others and the other is



*This is the second of a series of articles by Mr. Wilder on the building problems of the automotive merchant. The first was published in the issue of March 20 and was a discussion of the preliminary considerations of the dealer who has decided to build. This article goes further and points out the necessity of deciding in advance the class or classes of business that will be housed in the new structure. Other articles going into the detail of planning and construction will follow.*

to develop along the line of the department store idea, bringing all branches under one roof. We find many small places specializing because they are virtually one man places and it is not possible for one man to do more than one thing. But there are, in the larger cities, concerns larger than the largest small town businesses doing only one thing.

The small town dealer must be a general practitioner, for there is not enough of any one branch of business to bring him in a living and if he tries to handle cars at all he must handle all branches of the business. In the medium sized and larger towns, as well as the cities, there are also many general automotive stores, but many others that specialize. Here we find a business devoted to selling cars only while others are occupied wholly with service, electrical service, storage or some other specialized branch. Thus, to specialize or not to specialize is influenced by geographical location as well as personal inclination.

There are still to be found representatives of many branches of the trade housed in old buildings totally unsuited for their use, but these usually are new concerns which haven't the capital to erect a suitable building and are content to make the best of what they can find. Later, if successful, they will erect suitable buildings; if unsuccessful, they will probably disappear.

#### All Degrees of Splendor

Many new concerns are totally inexperienced in the lines they are entering and consequently do not know what to build even if they have the capital; consequently they, too, are cautious and usually take the best old structure available.

It is a foregone conclusion that each specialized branch calls for a specialized building to house it. If one is to show cars, he must have a showroom in keeping with the product he handles. If he sells service he must have facilities for handling his customers promptly, while style is of less consequence.

Above all, the building should be such that in it the customers can be handled without congestion. It should be convenient and arranged so that customers need not come in contact with the departments where grease and dirt prevail. It should be so designed that the customer's interests are considered to an equal extent at least with the owner's, remembering constantly that the cus-

tomers is the owner's meal ticket, not his victim, and that the oftener the customer comes the better it will be for the owner.

With this thought in mind every customer—convenience can be designed into a building and much will be gained in the campaign to be popular with the customer.

The architectural style does not make so much difference as long as the building is attractive and up-to-date looking, if possible more so than those surrounding it, so that it stands out as an advertisement of progress.

There are certain features about automotive buildings which immediately brand them as such, the show windows and car entrances being the principal ones. It is well to make as much as one can of these features so that nothing will be lost that should have an effect on the customer. By making much of them, we mean making them attractive and inviting.

Sales rooms for cars may be found in all degrees of splendor. Some of the more elaborate city sales rooms with their indirect lighting effects, tiled walls and floors and expensive furnishings cost many thousands of dollars and are planned to appeal to people of means. Here high priced cars are usually sold best, it being a fact that people who are

in the habit of having the best will not patronize a shabby, cheaply built sales room unless it is absolutely necessary.

With the more inexpensive cars the case is somewhat different. People who buy them cannot be so particular, they must get as much as they can for their money and they disregard style in surroundings to a considerable extent. It can almost be stated as a fact that too elaborate a showroom is a detriment in selling the low priced cars since the people who buy them have an idea that too much of their money is going into decorations; they figure that if there is profit to support such style why not make a better car or lower the price instead. The same psychological condition is found in restaurants, and formerly in saloons.

Just as style, suitable surroundings, appropriate offices, and conference rooms are important to a selling organization, so there are certain conditions which it is important to incorporate into the service station.

It must be laid out to avoid congestion if it is to be efficient in respect to labor, to have sufficient light and above all must be airy and well ventilated, so that it is cool in summer and well heated in winter. By "well heated" we mean heated to the right degree and not hot.

#### A Place for Drive-In

There must be a place where customers can drive in their cars and receive attention, either in the way of minor adjustments or diagnosis of more serious troubles. The freer this reception room, or service sales room, as it is more properly called, is from the grease and dirt of the shop, the better, and if it can be suitably connected by pleasant waiting rooms for both men and women customers, the happiness and contented condition of those customers will be enhanced.



There must be a place, away from the sales room, where the customer may drive in for attention.

Perhaps the dealer will have one building for both sales and service as is the case in a majority of places. Under such conditions it is always best to separate the two departments as much as is possible with both under the same roof. If the lot is a corner, have the service entrance on the side so that service customers will not come in contact with sales customers. It will not help sales any to have owners telling their troubles within the hearing of prospects. Should the garage have more than one floor, locate the service on top where light and air are most favorable, and where it is well removed from the sales department.

Should the garage be for storage only with little or no other interest, then the problem is in its simplest form. All that is needed is a broad expanse of unobstructed floor space so laid out that there are ample aisles and the maximum number of car spaces.

When the storage garage is in the large city where land is too valuable for such lavish use, the space must be gained by adding more floors and then the trouble begins again. Choice between elevators and ramps must be made and as a rule the higher the building goes the more expensive it is to operate and the less actual storage space it will have in proportion to its total floor area.

#### Must Play Them Up

Dealers who handle accessories must play them up; there is little chance of their doing much business unless they display their wares in an attractive manner and have a pleasant store in which to meet customers. The garageman who has a few odds and ends of accessories jumbled together in a corner, mixed in with junk and unsaleable articles would do better to throw the whole mass out and devote the space to some useful purpose. Unless one has a properly fitted up store and stockroom he should not allow salesmen to load him up with accessories no matter how attractive the proposition is.

Everywhere one goes among the small town dealers he runs into conditions of

*The development of adequate housing for retail automotive stores has been rather slow. In the early days of the industry it was only natural that the automotive dealer should utilize a building already standing, adapting it to his purposes as well as possible. As the industry has grown, however, it has become more and more apparent that buildings erected for general merchandising purposes seldom are suitable for an automotive establishment. This realization has given impetus to the construction on a large scale of garages, service stations, sales rooms and specialized automotive stores. Mr. Wilder of the MOTOR AGE architectural department has been able to help many automotive merchants design just the right kind of building needed for their business. His service is free to all MOTOR AGE readers who care to write for it. Letters should be addressed to the editor of MOTOR AGE.*

this sort. The dealer is led to believe that he will increase his income enormously if he puts in a certain line. He would, too, if he had any facilities for showing it, but no one ever sees it, it is not advertised and the dealer is too busy to call attention to it, consequently it remains in its hiding place till the season is past. Next season brings out some improvement in another line and his stock is little better than junk. If accessories are to be handled, build a suitable store and do it right.

The gasoline and oil service station is one of the branches that is making rapid strides in the line of specialization. Oil companies are placing filling stations at points of advantage throughout the country and even now they are doing a great share of the retail trade. They handle nothing at all but gasoline, oil and grease and offer a splendid example to prove that specialization in a big way pays. They prove another point by contracts, and that is that it is a mistake to try to do too many different things in a building that is too small.

Coming to the type of building most appropriate to these various branches there is always the question of the size of the business to be considered. For a large service station of several stories there is nothing so popular or so serv-

iceable as reinforced concrete. It is clean, the walls and ceiling smooth and non-dirt catching. It is as fireproof as anything can be. It is non-vibrating and non-sound transmitting.

#### Reinforced Concrete Used

The big city sales and service station is usually reinforced concrete or fabricated steel, though there is some mill construction which is very good if designed and built right. It costs considerably less than the other two and gets a low rate of insurance. The storage garage which predominates the country over, is a rectangular structure with four simple walls of brick, tile or cement block, the roof is trussed either with steel or wood, and there are no partitions except those around the office.

In the larger cities the congestion of the downtown streets has made necessary the construction of storage garages of great magnitude. The most successful of these are invariably equipped with ramps which make the rapid landing of cars during the rush hours much easier and more satisfactory to customers.

The special service stations for tires and batteries are as yet in a very undeveloped stage in the small towns, but in the larger cities there are some wonderful examples both from the standpoint of architecture and utility. These large establishments consist of a large garage for service with conveniently located shops, waiting rooms and sales rooms.

Washing plants belong to one branch that is not only being specialized in the cities but in the smaller towns as well. There are three kinds of these. One is where there are a number of drained platforms or racks. There the washing is done by hand. In another the car is run through a sprinkler system that loosens the dirt, after which the car is finished by hand. The third uses a shallow bowl or pond where the car is driven around long enough to loosen all the dirt after which it is finished by hand. All these methods require special buildings.

It is impossible, in so short an article, to go into detail about the building best suited to this or to the various other branches, specialized or otherwise, but they will all be taken up together with constructional details and features in later articles.



*There are still many concerns housed in buildings totally unsuited to their use.*



# Rickenbacker Announces Its Vertical Eight

*Many Unusual Features in Evidence Throughout the Engine and Other Units of Chassis. Nine Bearings on Crankshaft. Intake Manifolding Arranged as for Two Independent Four Cylinder Engines. Eight Has Several Features Common to Rickenbacker Six*

A NEW car with an eight-in-line engine has been added to the Rickenbacker line and is now in production. The new chassis, which will be known as the vertical eight, will supplement the six, which will continue to be the backbone of the line. Three body types, a sport touring at \$2195, a coupe for \$2695, and a sedan listing at \$2795, will be supplied on the standard 121½-in. wheelbase chassis. Four-wheel brakes, oil rectifier and air cleaner are included as standard equipment. Balloon tires are optional at \$100 extra.

Performance, as secured by a high ratio of engine torque to car weight, has been made one of the outstanding characteristics of the new car. With a bore and stroke of 3x4¼ in. and a compression ratio of 4.76 to 1, an output of 70 hp. at 3000 r.p.m. is secured. This is one horsepower for each 3.83 cu. in. piston displacement, the total displacement being 268.56 cu. in. An acceleration of from 5 to 25 m.p.h. on high gear in 6¼ sec. is claimed.

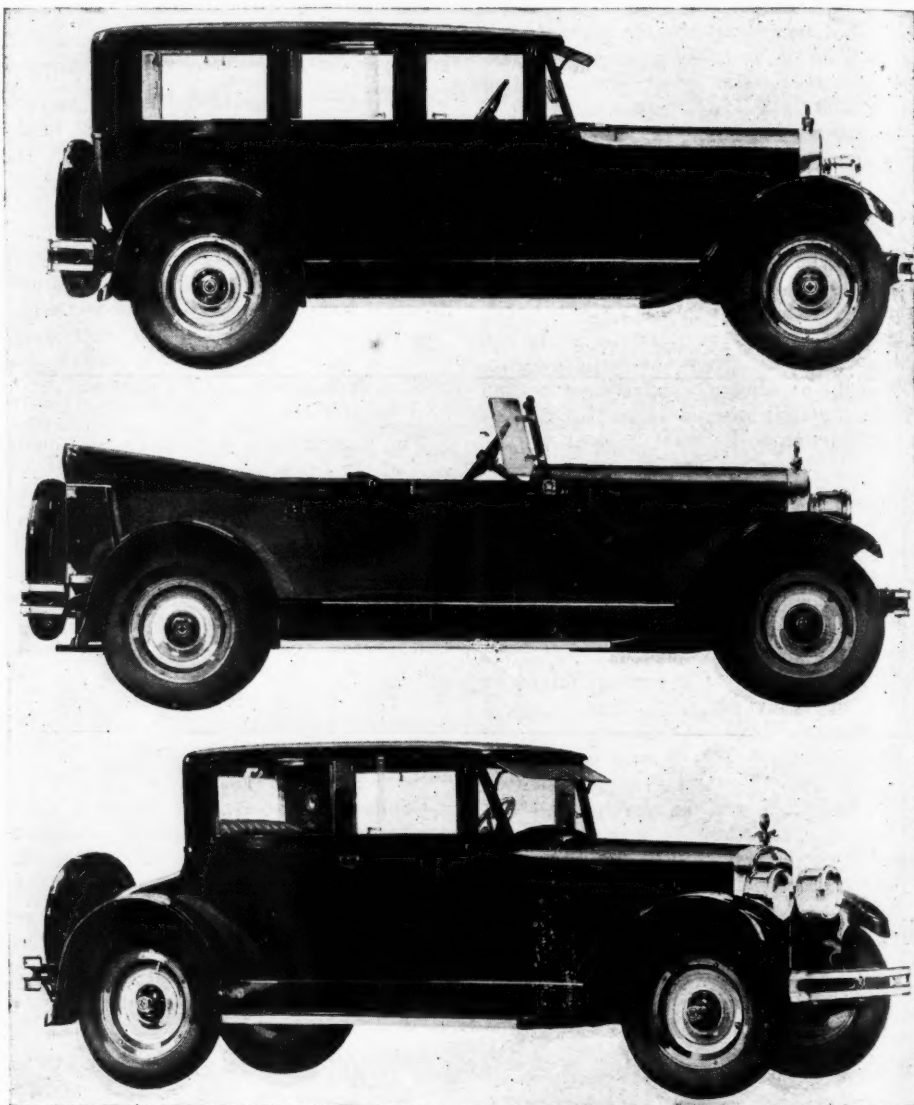
## Unusual Design Features

There are a number of unusual design features, particularly in the engine. Some of these bear the stamp of the Rickenbacker air experience, the radiating fins on the cast aluminum oil pan, cold air blast for oil cooling in summer and a dual or duplex carbureter.

Probably the most unusual engine feature is the complete separation of the camshaft from the crankshaft compartment. The camshaft is carried in a separate oil-tight compartment and is completely immersed in oil at all times. This is directly in contrast with the usual method of oiling the camshaft by the spray from the crankshaft and rod bearings.

Like other eight-in-line engines, the Rickenbacker is arranged as a central and an outside four. The division into two fours, however, is carried out further than in other types in that it is carbureted and ignited as two fours. The manifolding is separate to each four to prevent overlapping and designed so that the characteristics of each passage from carbureter to cylinder is the same, to provide uniform distribution.

The eight cylinders are cast in an L-head block. The heads are incorporated in a separate casting which is formed to provide turbulence of the gasses in the



At the top is the Rickenbacker sedan; center, the phaeton, and at the bottom the coupe

combustion chamber to a degree desirable for absence of detonation. The combustion chambers are domed over the valves and taper down to a small clearance on the opposite sides. The form is the same as that used on the Rickenbacker six. For uniformity the chambers are machined. The spark plugs are over the inner sides of the intake valves. A large water space is incorporated in the head over the combustion chamber and surrounding the spark plugs.

As in the six, gray iron three-ring pistons with adjustable wrist pin bushings are used. The adjustment is taken up by means of a clamp bolt in the upper end of the rod.

Nine bearings support the crankshaft. To further carry out the provisions for rigidity the block is stiffened by webs on bridges which act as the bearing supports. The oil pan also lends support as a structural member, the ribbed cast aluminum contributing to the stiffness of the assembly. The bearings are all



flanged type which is probably unique for production of American cars regardless of price class. As in the six, two flywheels, one at each end of the crankshaft, are employed.

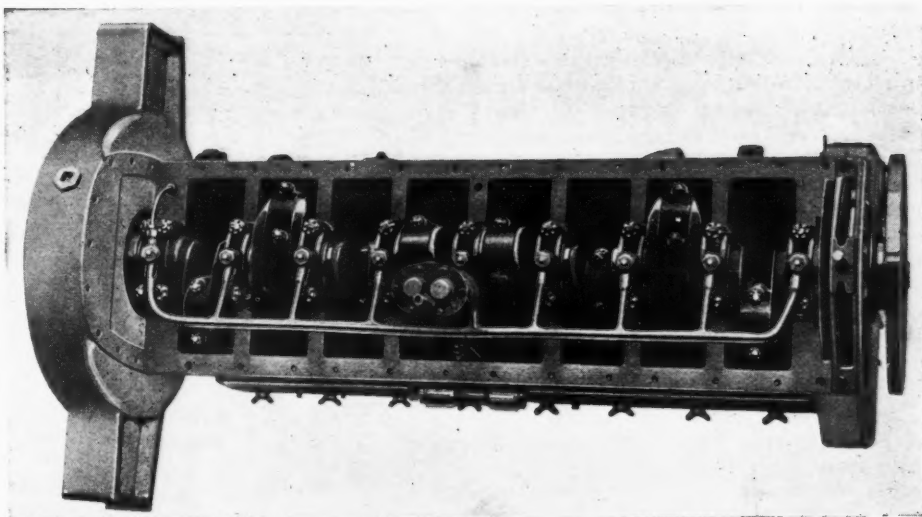
The valves are driven through a Morse  $1\frac{1}{2}$ -in. silent chain. This is a triangular three-sprocket arrangement, the third sprocket taking care of the generator and water pump. The crankshaft sprocket has 20 teeth, the camshaft 40 and the generator 15. The camshaft is supported on light bearings, held in webs in the camshaft compartment. Oil is fed into this compartment by the oil relief system and splash, and overflows back into the crankcase. Thus, besides the oil submerged camshaft the mushroom ends of the tappets are always immersed in oil and the valve stems are constantly under a spray of oil and therefore to a large extent air-cooled.

#### Covered With Aluminum

To render the valve system accessible the entire left side of the engine and extending from the crankcase to the cylinder head there is a large compartment covered by a cast aluminum plate. When this plate is removed the entire valve mechanism including the tappets, springs and camshaft are exposed and the entire blocks of tappet guides can be removed. If only simple tappet adjustments are necessary, smaller hand holes in the large plate covered by small plates can be quickly opened by turning six thumb screws. This permits the adjustment of the tappets without draining the oil from the camshaft compartment.

Mushroom tappets of hollow section transmits the valve drive through the conventional nut adjustment to the valve stems. The valve stems are inclined at an angle of 3 deg. to the axis of the cylinder. The valves are  $1\frac{1}{2}$  in. nominal diameter with  $\frac{3}{8}$  in. diameter stems. The valve springs are 45 lb. for both inlet and exhaust and the tappet clearance is .008 in. The valve tappets are carried in demountable blocks in the same manner as in the six. Each end block in the eight carries six tappets and the center block four. The center block also carries the ball thrust bearing and the spiral bevel gear which drives the oil pump and the ignition distributor, these being at opposite ends of the vertical shaft which is located at the center, longitudinally.

The oiling system on the eight does not differ from that on the six with the exception on this new model there is a cast aluminum oil pan on the bottom of which are radiating fins for cooling the oil. Another method of cooling the oil is also introduced on this model, by means of the incoming cold air on the way to the carburetor. This air blast air cooling is used only in summer when the conditions are such that the driver has the dash regulation in the summer position for admitting cold air to the carburetor. In the winter when the dash adjustment is such that hot air is taken into the carburetor the oil cooling



*This shows the nine-bearing crankshaft of the Rickenbacker eight. Note the clever method of attaching the oil leads to the main bearings*

device is not in operation since the air is taken through a different passage.

As indicated above, the driver may utilize either one or two air intake passages. This is effected by the use of a bifurcated casting with a two-way valve. One passage of the casting is jacketed for a short section of its length. It is through this jacket around the air intake tube that the hot cylinder oil passes and is cooled by contact with the cold walls. The other passages for use in cold weather passes from the air cleaner directly to the carburetor without contact with the oil jacket. The Rickenbacker

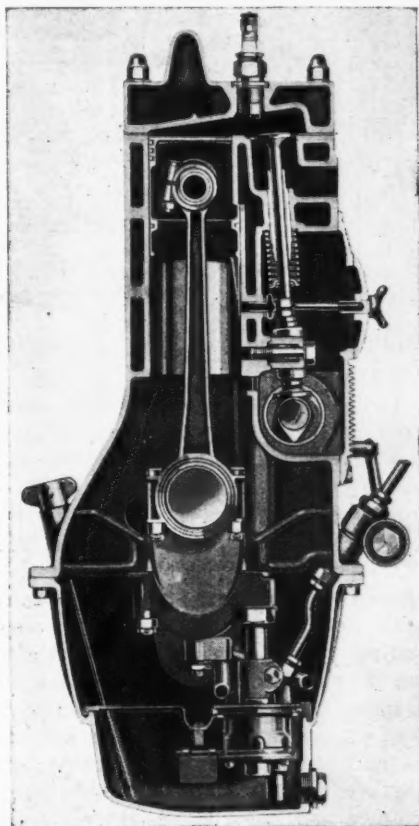
air cleaner as employed on the six is also used on the eight.

The carburetor is a dual type Zenith, with fixed jets. It is supplied by a dual feed line from the gasoline tank to the vacuum system. This furnished a reserve supply of fuel without thought of the driver, and in case of a leak in one line gives him another. Two pipes lead from the tank, one terminating at a lower point in the tank to the other and constituting a 3-gal. reserve supply. A three-way valve controls the reserve.

#### New Form of Hotspot

The intake manifold had been arranged to avoid difficulties attendant upon attempting to manifold the entire eight cylinders as a single engine. The manifolds are arranged as if for two independent fours in exactly the same way as in the crankshaft. In other words, just as there is an inside and outside four on the crankshaft so is there an inside and outside four on the manifolding, both intake and exhaust. This dual intake manifold is so designed that the characteristics of each passage from the carburetor to the cylinder are the same. The intake passage is provided with a new form of hotspot in which the exhaust is bled into the hotspot chamber, but not bled out. In other words, a blind chamber is created into which the heat enters but from which there is no outlet except to back up. The theory advanced for this is that as hot gasses will readily go into a compartment filled with cold air, the heat enters rapidly until the temperature of the chamber has increased to a degree fixed by the operating conditions of the engine. The air is then imprisoned there serving as a cushion to keep additional gasses out and maintained an equal temperature under all driving conditions.

Two exhaust pipes are fitted with independent manifolds for the inner and outer fours, thus eliminating back pressure in the exhaust line. The muffler is also a dual type although incased



*Cross section of the Rickenbacker eight engine. This shows clearly the separate compartment for the camshaft*

in a single housing, so that the right really exhausts as two fours.

Ignition also is by a dual arrangement provided by a Delco system that has been specially designed for this engine. There are dual contact points on the rotor of the breaker mechanism as well as a dual condenser and dual coils. The electrical lighting systems are American Bosch with U. S. L. storage battery of 166 ampere-hour capacity.

The vertical eight like the six is equipped with the Skinner oil rectifying system. This has been described in this publication, and is operated on the distillation principle.

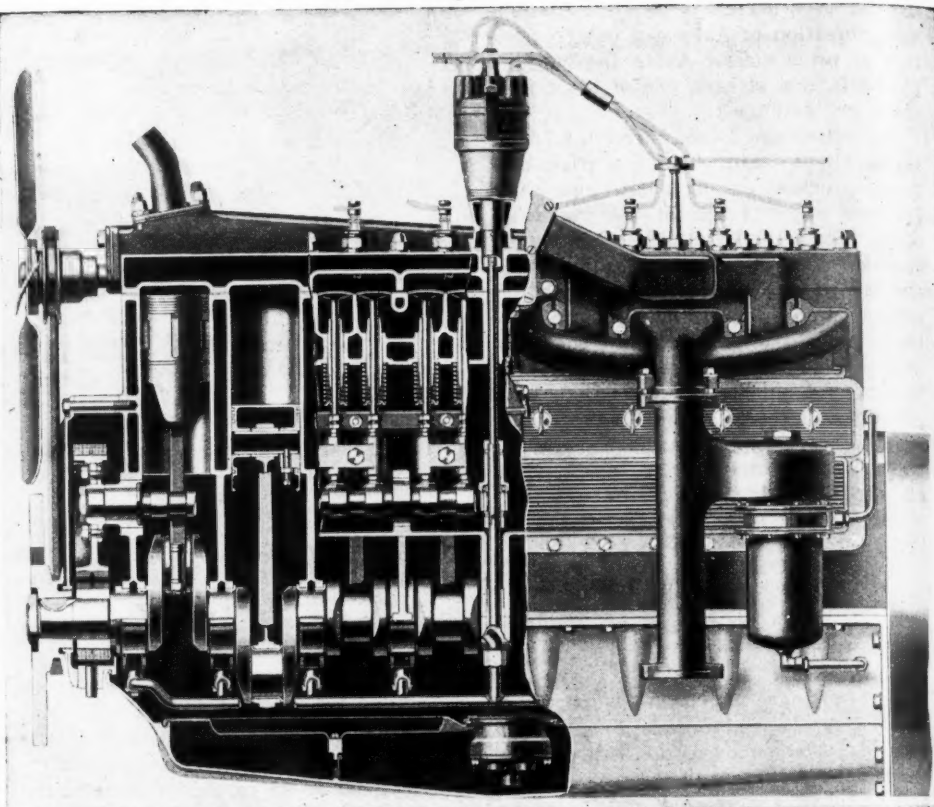
As in the six engine, clutch and gear-set are mounted on a unit powerplant with three-point suspension. There is a slight departure from the six in the method of supporting the front end. Instead of the annular bearing furnishing the third point in the three-point suspension as in the six, the new eight rests on a small flat surface at the center of a forger member, the ends of which are attached to the side members of the frame just behind the radiator. Between the engine and support is interposed a thick leather washer which permits of all the flexibility necessary to relieve the engine of road strain and at the same time furnishes a solid support for the powerplant.

The clutch is the same type as in the six but heavier, to take care of the increased torque. It is a multiple disk type running oil. The transmission gearset is also heavier than in the six and in this assembly is incorporated a new feature in the way of a provision for the return of oil from the bell housing to the crankcase. The clutch release is oiled by pressure feed the same as the engine and to prevent the accumulation of more oil than desirable in the clutch compartment, the rear flywheel acting as a centrifugal pump throws the oil into the upper part of the bell housing where it is caught in a groove and the surplus returned by gravity to the crankcase.

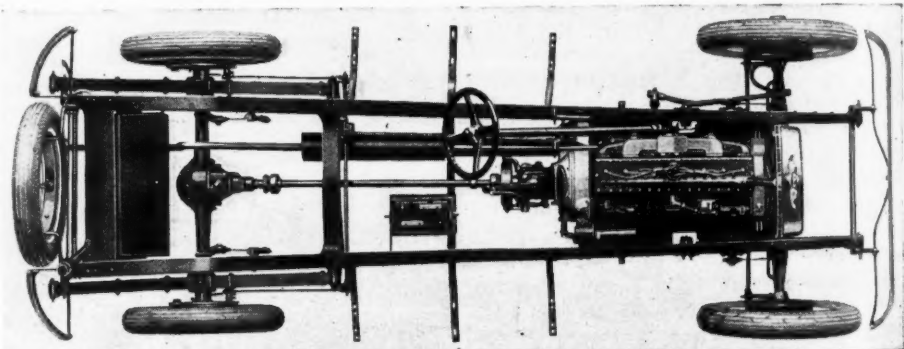
#### Some Parts Like Six

The drive members such as the propeller shaft, rear axle, etc., are practically identical with the six but made heavier to meet the increased weight and torque requirements. One of the new features which has been recently incorporated in the six and which is also used in the eight is the method of automatically lubricating the pinion bearings both front and rear. A patented construction is employed whereby the oil is scraped off the side of the ring gear, and deposited in the front whence it flows back through the rear bearing and thence to the differential case again.

The four-wheel brakes are of the same internal expanding type mechanically operated as in the six. The gear type differential equalizers are also incorporated. An improvement has, however, been made in the brake operating mechanism by the use of outboard bearings at both ends of the front brake shaft, in



Partly sectional view of the Rickenbacker engine. This shows also the extension on the skirt of the pistons. The oil pump is at the bottom of the distributor shaft



Plan view of the Rickenbacker Vertical Eight chassis, which has much in common with the Rickenbacker Six so far as the general layout is concerned

addition to the bearings in the bell housing.

The same type of spring suspension as used on the six is employed on the eight. The springs are longer, being 59 in. center to center, and equipped with Hartford shock absorbers both front and rear.

The frame is 8 in. deep. The front engine support is independent from the cross frame member and a cast-bronze tank constitutes both the tank bottom and its support. This construction making it possible to readily remove the radiator after which it is possible to take off the chain, camshaft or any major part of the engine without disturbing any other part. This is claimed to be simpler and more accessible when one unit is used to perform the three functions of front cross member, engine front support and radiator support. Steering

is by worm and wheel with  $11\frac{1}{2}$  to 1 reduction. This ratio in connection with the ball-bearing spindles is claimed to give easy steering even with balloon tires.

The body types are new and designed particularly for this chassis. The five-passenger sport phaeton has low long lines and is trimmed with leather. The sedan and coupe are upholstered in mohair. The closed models are provided in sloping windshields and the equipment of all models includes a double lock which operated on both the steering gear and on the ignition. The equipment also includes bumpers front and rear, motometer, motometer lock, motometer wings, drum tire cover, clock, automatic windshield wiper, vanity case, cigar lighter, gasoline gage, trouble lamp and automatic car heater.



# Cleveland Places New Models With Many Improvements on Market

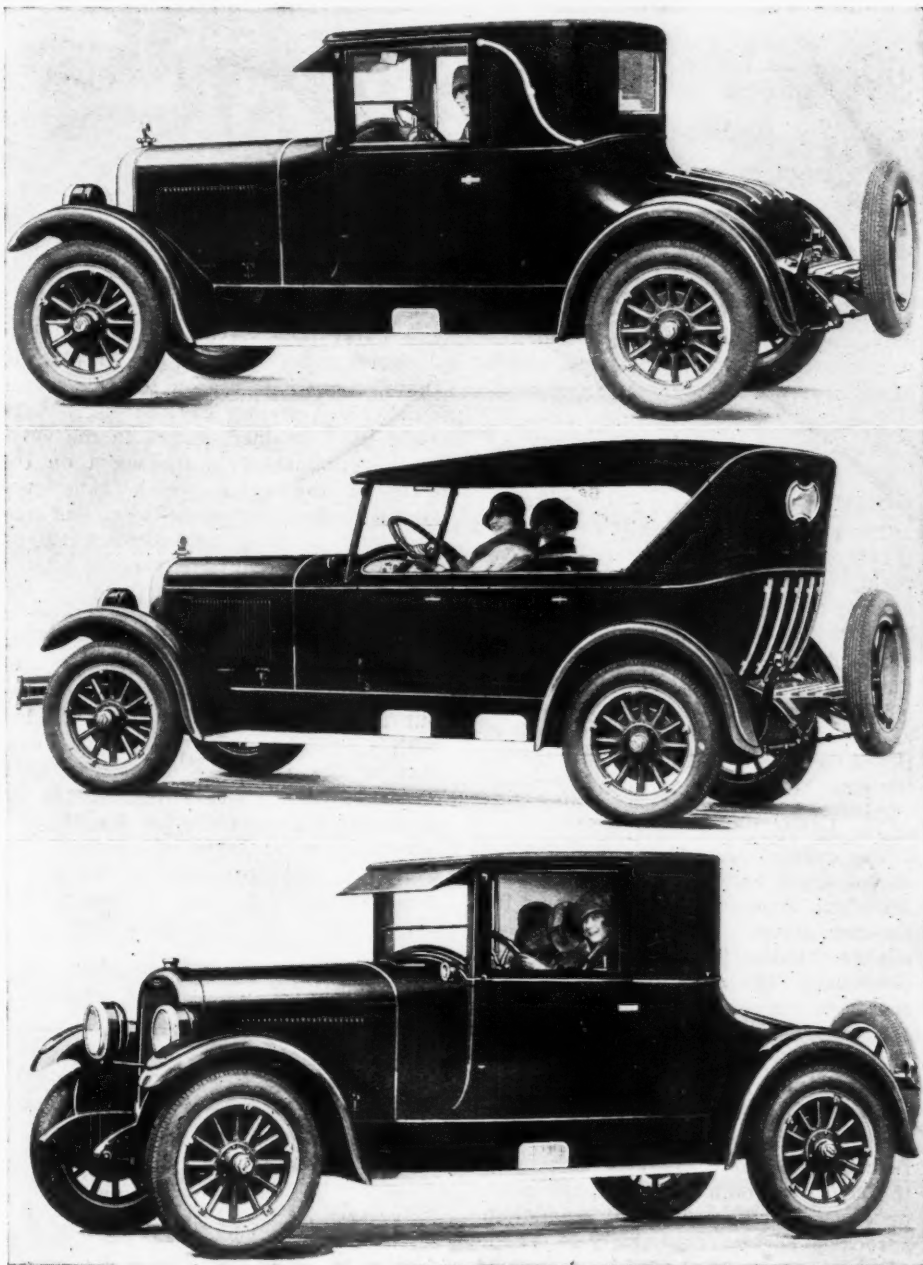
*"One-Shot" Central Chassis Oiling System Used. New Car Has L-Head Engine, Longer Wheelbase and Balloon Tires. Six Body Types Available*

A LARGER six-cylinder engine, larger wheelbase, pressure lubrication to the main bearings, "One-Shot" chassis lubrication system, balloon tires as regular equipment and improved bodies are characteristic features of the 1925 model Cleveland. An L-head engine is now used in place of the former valve-in-head type and practically every other unit has been altered over the previous model. Mechanically operated four-wheel brakes can be had at an additional cost of \$50. The price range is from \$1095 to \$1495 as compared with \$1045 to \$1395 on the 1924 line.

The new car was designed with performance as a primary consideration. It is claimed to be capable of acceleration from 5 to 25 m.p.h. in less than 7 sec. and a speed range of up to 65 m.p.h. on high gear. The new engine, which is a  $3\frac{1}{8} \times 4\frac{3}{4}$  in. six, as compared with the  $3\frac{1}{2} \times 4\frac{1}{2}$  in. overhead type used formerly, peaks at 60 hp. at 2800 r.p.m., as compared with 45 hp. at 2200 r.p.m. for the previous model. It is also claimed that the car will average better than 20 miles per gallon of fuel with any style of body. A test is said to have been made at the factory on one of the production engines which was operated for the equivalent of 10,000 miles at 50 m.p.h. It was found at the conclusion of the test, it is claimed, that the horsepower had slightly increased, and the engine could be slowed down to 82 r.p.m. with wide open throttle and full load of 45 lb. firing regularly and steadily, indicating that the evenness of compression had not been affected.

The engine has a fairly high compression, the clearance being  $21\frac{1}{2}$  per cent of the total volume, and a form of combustion chamber designed to produce a condition of high turbulence. The chamber is domed over the valves and tapers down on the opposite side to the minimum practical clearance.

The cylinder block is cast separately from the crankcase, which extends down  $2\frac{1}{2}$  in. below the centerline of the crankshaft. The camshaft is placed in the right side of the crankcase instead of the left as previously, so that the shaft is now in the path of the oil thrown by the crankshaft, giving more oil to the cam surfaces, camshaft bearings and tappets and cutting down the amount of oil thrown into the cylinder barrels. The breather with this new arrangement is moved to the left side of the case away from the oil throw and is placed at the center of length of the crankcase to keep



*At the top, the Cleveland coupe; center, the phaeton, and at the bottom the business coupe*

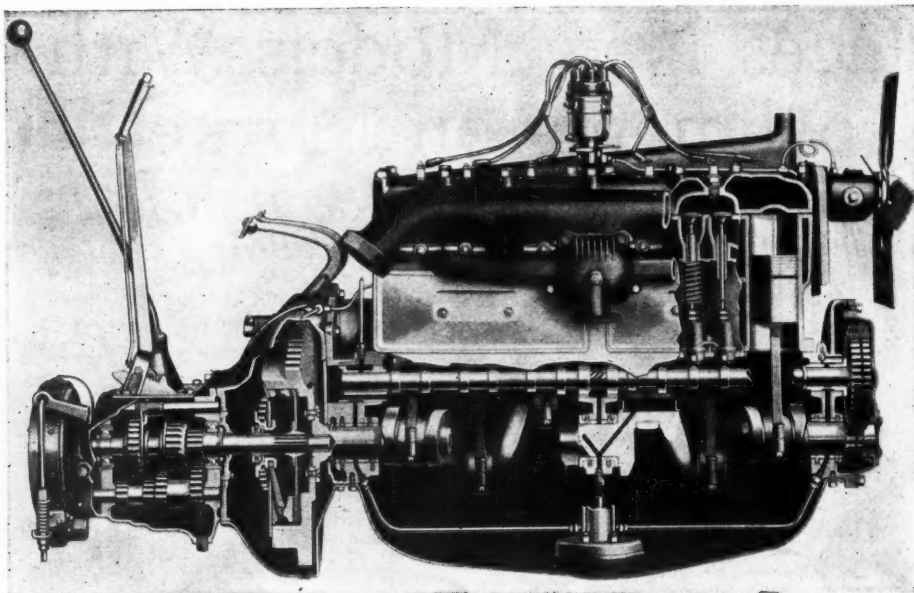
the oil fumes away from the closed bodies.

The cylinder block is designed with large water passages surrounding each cylinder and each valve. The water enters directly below the valve passages with equal distribution in both ends of the block. The cooling is claimed to be extremely uniform with a maximum variation of 3 deg. Fahr. The cylinder bores

are now given a honed instead of a ground finish. The cylinder head is detachable.

The crankshaft furnishes a good example of the increase in power and sturdiness of the new model as compared with the old. The new shaft weighs 67 lb., as compared with 50 lb. for the previous model. The main bearings are now bronze-backed instead of





*The new L-head 3 1/8 x 4 3/4 engine in the Cleveland Six*

plain die cast, and they are of the shimless grooveless type. The main bearing dimensions are as follows:

	Dia.	Length
Front .....	2 3/4	2 1/2 in.
Center .....	2 1/4	2 5/8 in.
Rear .....	2 3/4	3 3/8 in.

The pistons are long skirt design as in the previous model, but now have two plain 1/8-in. rings instead of 3/8. There is also an oil scraper ring. Beneath the lowest ring an oil groove has been provided, drilled with escape holes, to reduce the amount of oil entering the combustion chamber. The piston clearance, as before, is .003 in., and the piston is relieved on the sides at the ends of the piston pins.

#### Connecting Rods Different

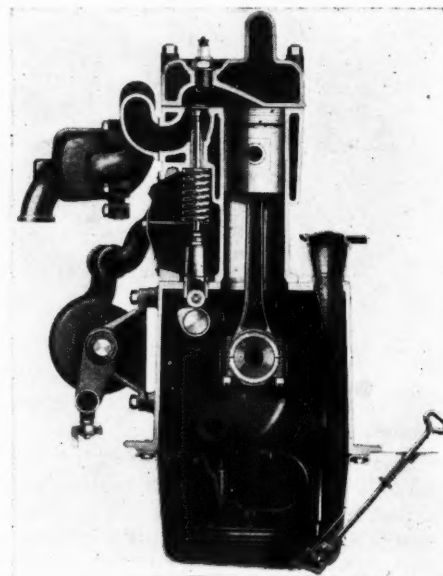
The connecting rods are also different as compared with the previous model in that the bearing metal is now poured into the rods under pressure. The bearings are the shimless type broached to .003 in. clearance. The rods are 10 1/4 in. long center to center and are held to within 1/3 oz. The pin bearing is a bronze bushing.

Morse silent chain drive is employed in the new model as it was in the former design, but the entire front end has been redesigned. There are now 61 links in the chain as compared to 71, the center distances being different and the sprockets having respectively 21, 42 and 16 teeth as compared with 21, 42 and 14. The change increases the contact area of the chain with the sprocket and also meets the recommendations of the chain manufacturers for a greater number of teeth on the accessory shaft. The front end is also improved from a service standpoint. It is no longer necessary to remove the radiator, chain cover, etc., to remove the generator. It can be done now by removing the coupling and three supporting screws.

The camshaft is carried on four bearings and drives the valves through roller

followers. The valves are 1 1/8 in. clear diameter and are 30 deg. type in place of the 45 deg. The reason for this is the quicker and greater gas opening for the same lift. Another change in the valve is the elimination of the relief on the stem of the valve which experience showed to be a carbon collector and consequently a cause for sticking valves. Instead of the stem relief there is a taper relief on the guide which is not so apt to collect carbon, it is claimed and, if carbon is collected, sticking is unlikely. As an example, it is pointed out, the effect would be very much like driving out a sticking taper pin as compared with a straight pin. Once the line contact of the taper pin were broken, it would be free, whereas the straight pin might stick along its entire length.

Double valve springs, adopted by Cleveland last year, are continued this year but there is less tension on the spring when the valves are closed, there-



*Section through new L-head engine showing high turbulence combustion chamber*

by relieving the mechanism of wear and reducing the impact on the seats.

Pressure lubrication with leads to all parts of the engine is supplied from the two-gallon reservoir in the oil pan by a gear-type pump driven by spiral gears from the camshaft. The oil first passes through a screen into the pump. From there it passes through three large pipes directly to the under side of the three main bearings. It then passes through the hollow crankshaft to the connecting rod bearings, and around the main bearings to the camshaft bearings. At 20 m.p.h. 1 1/2 gal. of oil is circulated through the engine every minute. The oil consumption is claimed to be 1000 miles per gallon at low speeds down to 500 miles per gallon at high speeds.

#### Pressure Cooling

Cooling is by pump as formerly, but the pump is now positively driven through a flexible coupling instead of a triangular belt. The water pump bearing size has been increased and there is only one packing gland instead of two. The radiator is now made by the Cleveland company. The fan diameter is 15 1/2 in. instead of 13 in. The belt is no longer in front of the fan but is behind the fan bearing, making a better balanced drive. The oil reservoir in the fan bearing is larger and it is now replenished from the one-shot oiling system which also takes care of the chassis lubrication as will be explained later. Springs are now installed under the radiator hold-down bolts so that under rough usage the core is more free from strain.

The electrical system is Bosch, including the two-unit starting and lighting installation. The ignition advance is arranged to break at upper center with the manual advance, with 18 deg. more advance automatically controlled.

#### Gearset Heavier

The gasoline and fuel system is supplied by vacuum tank to a Schebler model S-1 carburetor. This is an air-valve type made without a choke in the air passage so that the amount of raw gasoline drawn into the engine in starting will be minimized. The portion of the intake manifold between the horizontal section and the carburetor is surrounded by an exhaust jacket through which the exhaust from the three forward cylinders passes. The intake manifold is a straight line type with rather abrupt turn and designed to make the characteristics of the gas passage from the carburetor to each cylinder similar.

The clutch is still the Borg and Beck 10-in. unit, but is the new type in which the release collar is pushed forward instead of pulled back in releasing. The rotating parts of this clutch are considerably lighter and the overhang of the transmission gearset considerably less than with the old type.

The transmission gearset is heavier throughout. The shaft diameters are larger and the gears are now made of

U. M. A. steel (high carbon chrome alloy). The engine flange is now a complete circle instead of the U-shape formerly employed. Large ball bearings replace the roller type and there is a longer shifter lever.

The final drive is through a hollow propeller shaft with flexible rubber disk universal joints. The rear axle is a floating design fitted with Timken bearings. This axle is similar to the previous unit, but heavier to take care of the greater torque. It is made completely in the Cleveland plant. The front axle which has been designed to take the optional front wheel brakes is now the Elliott instead of the reverse Elliott type formerly employed and it is stiffened torsionally. As before taper roller bearings are used for the front wheels.

When front wheel brakes are installed, the front brake, anchor support brackets, etc., are attached to brake carrier disks which transmit the stresses to the steering knuckles. Owing to the stresses imposed on this disk it is provided at its center with a rectangular shaped opening which fits over a similar boss on the steering knuckle forging. While held in place by four countersunk screws, these do not take the braking stresses, the rectangular boss performing this function.

#### "One-Shot" Lubrication

The front brake and operating mechanism are interchangeable with the rear. The brake rods from the forward brake cross shaft do not run direct to the brake band levers but instead to levers at the ends of small cross shafts supported on the front axle. The outer ends of these short shafts terminate in ball type universals which stand directly in line with the axes of the steering knuckle pins. Through these universals the load is transmitted to the second brake levers which are supported on the steering knuckle forgings and therefore turn with them when the front wheels are moved as in steering. From these second short levers the motion is transmitted to the brake band levers through the medium of short links. The inner ends of the short cross shafts rest in ball and socket joints to provide flexibility and eliminate bending. The short shafts are covered with leather boots.

One of the most noteworthy features

of the new car is the adoption of the Bowen One-Shot chassis lubrication system as standard equipment. One stroke on the plunger located in the front compartment and accessible to the driver's foot sends oil to twenty-three working parts on the chassis. The quart oil reservoir is connected to the various lubricated points by copper tubing and the amount supplied each point is governed by regulators which are proportioned to fit the needs of the various points to be lubricated. The oil is not forced to the location immediately but is held by the regulator or header and allowed to lubricate the part gradually, thus giving a continuous supply of oil. This eliminates grease cup and grease gun lubrication.

The frame design is much the same as the previous Cleveland except that it is  $2\frac{1}{2}$  in. longer. The frame is 6 in. deep and of  $\frac{1}{4}$  in. stock. The front cross member is heavier to take the heavier engine and the second cross member is now eliminated as the bell housing performs this function. The springs are chrome vanadium steel semi-elliptics with a silico-manganese main leaf in the front spring to form a torque member on account of the added stresses due to the front wheel brakes.

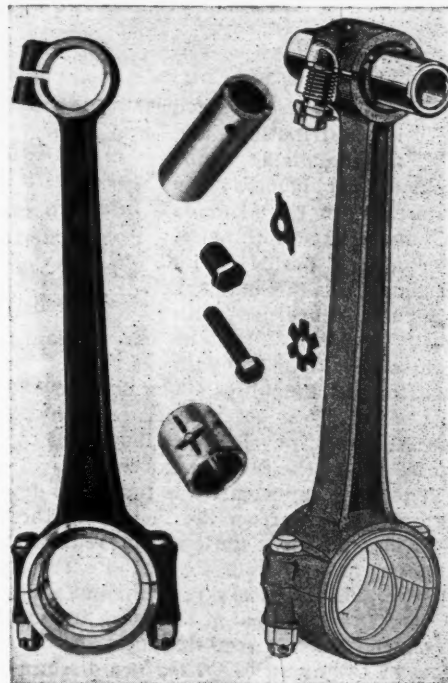
The steering gear has been made suitable for the balloon tires which are fitted as standard equipment. The change is particularly in the ratio of the gear which is now 10 to 1 instead of  $7\frac{1}{2}$  to 1. An eccentric bushing has also been added on the worm shaft to take up wear in the gear teeth. The balloon tires are 31 by 5.25 in.

#### Bodies Redesigned Throughout

The bodies have been redesigned throughout. They are longer with a high narrow radiator. A raised bead extending from the radiator all around the body of the touring car accentuates the length. The cowl is rounded and is fitted with a lever type of ventilator. The seats are built well below the upper edge of the body and are upholstered in the open and coupe models in leather. In the sedan the upholstery is taupe plush. The instrument board is entirely new with a conventionally balanced arrangement of the glass covered instruments.

## Adjustable Wrist Pin Bearing

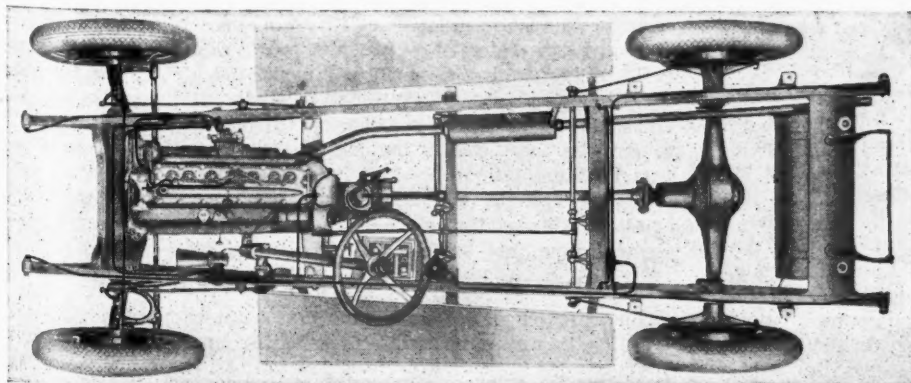
**A**N adjustable wrist pin bearing has been brought out by the Rickenbacker company. The new bearing consists of a bronze bushing with rectangular slots milled at equi-distant points, leaving at these points only a thin outer wall of bronze.



A hollow bolt, or "distance thimble," running on a solid cap screw, serves to make and retain a fine and accurate adjustment; and is so simple to do that any owner of a mechanical turn of mind can do it himself just about as well as the most skilled machinist. All the tools required are two standard wrenches—to fit heads of cap screw and hollow "distance" bolt. In fact, for ordinary adjustment only one socket wrench is necessary. Because, by simply backing both bolts off together—which can be done by leaving the lock-washer "locked" and turning the larger bolt-head—both will back off. And, as the threads are different (24 to the inch in the cap-screw and 20 to the inch in the distance-bolt) the act of backing both off results in tightening the bearing. A one-sixteenth turn of both bolts contracts bushing a half-thousandth (.0005) in., which will usually be sufficient.

## Packard Car Illustrated

Through an error made in the make-up some of the copies of the June 19 issue of *MOTOR AGE* contained a cut of a Packard enclosed car which was designated as a new Willys-Knight coupe in connection with an article on page 13. The error was noticed after a part of the edition had been printed and was immediately corrected.



Plan view showing "one-shot" lubrication system



# Time Payment Sales Enlarge Dealer's Field

*Most Important Factor in Extending Motor Car Market, Says President of General Motors Acceptance Corporation—Details of Plan Explained*

By CURTIS C. COOPER, President,  
General Motors Acceptance Corporation

EVERYONE engaged in distributing and merchandising motor vehicles should be vitally interested in the methods of financing retail sales. For a long period of its history the motor industry was not concerned with such problems. It was confronted chiefly with distribution difficulties. The demand exceeded the supply and the industry was only concerned with the problem of obtaining a wide-spread physical distribution of the product in the territories where the demand existed.

The sales philosophy was limited to devising ways and means of getting cars from the factory to the distributor or dealer. The manufacturer until recent years found it unnecessary to concern himself with the dealer's problem of moving cars to the purchaser. Every motor manufacturer is now engaged in a very active campaign to secure the market for his particular product. This is resulting in a new sales philosophy on the part of the factories. They are directing their attention more and more to dealers' problems and ways and means of developing marketing facilities. The dealer's and manufacturer's interests in this respect are identical. Both manufacturer and dealer are interested in developing every legitimate marketing facility and directing that development along sound merchandising lines. They recognize the necessity of joining hands in solving these problems, for the success of the dealer in moving the product to the consumer measures the success of the manufacturer.

The most important single factor in extending the market for motor cars in recent years has been the development of the credit market, familiarly known as the installment or time sale. All authorities now agree that the development of the motor industry could not continue indefinitely with only a cash market. The motor vehicle is probably the largest unit of merchandise sold in quantity to the individual consumer. The initial outlay to acquire an automobile is so large that the extension of credit to the purchaser has been merely a logical step. A means was found to meet the universal demand for the motor car by enabling the prospective purchaser to pay for his car out of income instead of capital. It increased the number of prospective users by millions.

## Many Products Sold on Time

From time immemorial goods have been sold to consumers on a credit basis. The motor car has but recently come into the enjoyment of this additional market. Like every new development, it has caused some comment and criticism. A few critics have gone to the extent of suggesting that the purchase of motor vehicles on a credit basis should be in some manner restricted. They have lost sight of the fundamental position which the motor car holds to-day and have recommended that paternalism take the place of natural economic factors. The motor vehicle is a legitimate piece of merchandise. It is not an experimental machine, a dangerous instrument, a rich man's toy, or an economic waste. On the contrary, it is a valuable piece of property, and an essential incident to the standard of living of the average citizen, and contributes to the wealth of the community by furnishing a fundamental

*This discussion is an address delivered by Mr. Cooper before the World Motor Transport Congress at Detroit in May. It was intended primarily to give the delegates from foreign countries a comprehensive idea of how the time payment plan works in the United States. It is so complete an exposition of the subject that every automobile dealer will find it of interest.*

and essential commodity—transportation. It is, therefore, entitled to enjoy all the privileges and facilities held by any other product in the merchandising field.

The motor vehicle has frequently been designated as a "pleasure car" and it is true that a motor car

does give pleasure to its owner. But an attitude of mind which condemns the motor car because it gives comfort and happiness to the family reflects a vicious principle. A philosophy that attempts to discriminate in the ownership of property destroys individuality and invites social unrest. The people today need and want motor cars and it should be left to their independent judgment to determine when and how they shall obtain them. Any abuse of this independence of discretion will work out its own adjustment.

The credit market for motor cars has been developed to some extent in practically all countries of the world but has probably reached its greatest development in the United States of America. In this country the potential market for motor cars is approximately ninety percent a credit market in the low priced cars and fifty percent a credit market in the higher priced cars. Some dealers to-day are completely exhausting this market and others only partially so. In the country as a whole, it is hard to give an accurate estimate but general opinion indicates that probably seventy-five percent of all cars sold on a credit basis. In other countries the experience varies. We are surprised at the extent to which time sales financing is carried on in some European countries with apparently satisfactory results, while in some of the other countries there is a lack of receptiveness to the idea. It has been estimated that in some sections of the Scandinavian countries, Mexico and Cuba, about eighty percent of the total retail distribution is on a credit basis; in England and Australia fifteen to twenty-five percent. In France, Denmark and other countries the business is now being developed. In South Africa and the Argentine a low percentage of credit sales are made.

The difference in the extent of the use of this facility in the various countries is not so much due to any difference in fundamental conditions as it is to the failure to develop the market itself. Other products have been sold on a world-wide scale on a credit basis. One well-known sewing machine company has sales organizations located in practically every civilized hamlet in the world selling its product on the familiar installment plan. No automobile distributor or dealer can class himself as a real merchant until he has equipped himself to get the most out of his legitimate market. This requires that he must be equipped to handle credit sales, as this normally represents his largest potential market. The wide-awake dealer will prepare himself now and thus prevent the absorption of his market by his competitor.

## Real Merchant Will Reach Maximum Market

Generally speaking the main thing necessary to initiate the practice in any community is a better understanding of the business itself—a better understanding by the purchasing public of the advantages of the plan, a better understanding by the dealer as to how the business can be handled on safe



*The most important single factor in extending the market for motor cars in recent years has been the development of the credit market, familiarly known as the installment or time sale. All authorities now agree that the development of the motor industry could not continue indefinitely with only a cash market. The motor vehicle is probably the largest unit of merchandise sold in quantity to the individual consumer. The initial outlay to acquire an automobile is so large that the extension of credit to the purchaser has been merely a logical step. A means was found to meet the universal demand for the motor car by enabling the prospective purchaser to pay for his car out of income instead of capital. It increased the number of prospective buyers by millions.—From Mr. Cooper's address.*

and sound lines, and a better understanding by the banker of the desirability of a retail note or other retail receivable as a safe collateral security. The purpose of this paper is to discuss some of the principles and practices which have established themselves after years of experience and study, as being applicable to retail sales of motor cars on a proper credit basis with the hope that the information disclosed may have some value to the overseas dealer in the development of his market for motor cars. It is appreciated that many of the distributors attending this convention have had a long international experience in merchandising and banking and I cannot hope, therefore to tell them much that is new.

The policies and practices adopted in connection with the installment business are so intimately involved with general merchandising policies and practices that the dealer and manufacturer must try to regulate their development so that the greatest good will result to the industry. There is no new or mysterious fundamental principle involved in the credit merchandising of motor vehicles. It is merely an adaptation of old principles to a new situation. If we all cling to well-established principles of sound merchandising and banking, time sales of motor cars will be established on a proper basis. It is the responsibility of the dealer in conjunction with the manufacturer to build for the future by laying to-day the proper foundation for this new marketing facility.

#### Only Last Installment Completes Sale

It must not be forgotten that the facility of time selling may be made the subject of abuse. Care must be exercised to establish the business upon a sound basis, otherwise the whole institution will be brought into disrepute and progress forestalled. It should not be made the medium of moving a large number of cars in order to gain the immediate advantage of large turnover and sales profits without regard to the financial status of the purchaser. A point always to remember is that a time sale is not a complete sale until the last installment has been paid on the purchase price.

Properly handled, with due regard to well-established principles of merchandising and banking, the time sale business will bring satisfaction to the purchaser, increased income to the dealer, profit to the banker, and wealth to the community.

In some countries the automobile is not yet considered an important means of transportation but is still looked upon as a luxury. It is often so classified in the list of import duties, where it is mentioned as a "pleasure car." So long as this point of view prevails, time sales will be considered an unsound practice. This condition is aggravated in some countries where there is a prejudice against borrowing for any purpose. This same attitude of mind has prevailed in every country in the early stages of the development of the time market for motor cars. It was certainly true of the early history of the development of the business in the United States of America. The public was reluctant to buy on time the banks did not approve of the business, and even some dealers looked upon the business as undignified. This has all been changed and time sales of motor cars is a well-accepted institution in the United States. Considerable amount of educational work must be done by the dealer in other countries to bring about the proper attitude toward the motor car and its logical market.

Credit sales of motor cars to-day in the United States consist usually in delivering the motor vehicle to the purchaser on his making a down payment and undertaking to pay off

the balance in one or more installments, the seller retaining title to, or a security interest in, the car until it has been entirely paid for. There is very little business, if any, done on an open-account basis, in which the car is delivered to the purchaser merely on his promise to pay the purchase price at some future date, unsupported by any security. This class of business represents a negligible percentage of the total volume of credit business and is not within the scope of his discussion. My remarks will be confined to the installment business as it is now practiced.

#### Few Open Accounts

The various plans of time selling are designed to enable the purchaser to pay for the motor car out of his income without unreasonable risk by the seller. Terms as to amount of down payment and length of time of the accommodation for the unpaid balance vary in different territories, depending upon the merchandising methods of the dealer and the restrictions of the bank or financing company.

The general experience, however, would indicate that the purchaser should be required to make a down payment of approximately one-third and never less than one-quarter of the purchase price, with the balance payable in not more than twelve equal monthly installments. Exceptions may be made to these terms as local conditions and experience warrant but great care should be exercised in liberalizing these terms.

The down payment and length of term for the payment of the balance should never be so liberal that the car at any one time is worth less than the unpaid balance of the purchase price.

Expressed differently, the rate of payment by the purchaser should always amply exceed the rate of depreciation on the car. Local conditions will affect this factor; for instance, where road conditions are bad or drivers inexperienced, and the life of a car short, the down payment should be larger and the extension of time for the balance shorter than where local conditions are more favorable. The purpose for which the car will be used should have a similar influence on the terms of accommodation granted. Furthermore, accommodation for the balance should never be extended for a longer term than the period of time the average owner holds a car before disposing of it.

In any case, any dealer introducing time selling in his business should adopt a conservative policy until his experience indicates how liberal he can be without undue risks. The mistake never should be made of using the facilities of time selling to expand the market for immediate profit without regard for future risks involved. The desire to make a sale should not overcome the dealer's better judgment in selecting credit risks.

#### Monthly Payment Plan Meets Average Needs

It is not always necessary to have the balance of the purchase price payable in equal monthly installments. Experience shows, however, that the monthly payment plan meets the needs of the great majority of purchasers and is the most desirable from the collection standpoint. There is some business done on a weekly installment basis but it represents a very small percentage of the total and is not generally regarded as necessary or desirable. The main point to accomplish is to have the deferred payments coincide with the income of the purchaser. The balance may be payable in as few as one or two installments over a given period less than a year. In such cases the purchaser should have at all times a substantial equity in the car. This usually requires that a much larger down payment be made than in the case of monthly installments. The down payment usually required is forty or fifty percent of the purchase price.

At this point it might be well to refer to the fact that, where the income out of which payments are to be made is derived from the use of the motor vehicle itself, as in the case of a taxicab, or motor truck, experience shows that the transaction is less desirable than where the income is derived from an independent source. In such cases the dealer should make sure that the proposed payments will coincide with the probable income to be derived from the use of the vehicle. This is a mere business proposition and should be dealt with on that basis.

The terms on time sales of the used or second-hand car are usually not as liberal as those on a new car. This difference in practice is due more to the usual methods employed in merchandising the used car than to the character of the credit risk of the purchaser.

#### Two Chief Factors

The analysis of the credit risk is the most important function in time sales. Successful selling on credit is dependent on:

- 1st. Selecting "Good Risks." Hence it is necessary for the dealer to thoroughly satisfy himself by proper investigation on this score.
- 2nd. Extending terms as to down payment and maximum time that coincide with the purchaser's ability to pay.

These two requirements are fundamental in all lines of credit business and the merchandising of automobiles is no exception to the rule. The maximum amount of cash the purchaser can pay should be first ascertained, and then the manner in which he can pay the balance. It should never be suggested, in the first instance, that he pay only the minimum amount acceptable.

Sound extension of credit on automobiles requires that the purchaser invest a reasonable sum out of his own resources or capital, making it to his financial interest to carry out his obligation for the balance. This down payment may be made in the form of cash or property, but a note or other evidence of indebtedness should never be accepted covering all or any portion of the down payment.

If the installments are to be paid out of income received at certain times, the payments should be arranged to mature at, or just subsequent to, the dates the income will be received. This is not so important when sales are on monthly payments, as it is in those cases where the balance is payable in one or more payments during the year.

The down payment and the terms on the balance having been agreed upon, the next procedure is the obtaining of sufficient information from the purchaser to enable the dealer to reach a decision as to whether or not the purchaser is entitled to the accommodation. There are two basic questions which must be decided to the dealer's satisfaction before an automobile is delivered on time payment:

1. Can the purchaser pay as he agrees?
2. Will he faithfully carry out the obligation?

There is always some embarrassment in approaching an individual for information as to his credit status and this is true in varying degree in all countries. The tact and diplomacy of the seller will come to his rescue in such situations. No credit should be granted, however, merely on the blind faith that the purchaser will pay, but only after an analysis and understanding of the facts. It should be remembered that the purchaser is asking for a loan of substantial amount and therefore is under the obligation of giving information on which the loan can be intelligently granted. In some communities the prospective purchaser is well-known to the dealer and an extensive inquiry is unnecessary. Where local custom makes it difficult to secure credit information from the purchaser it frequently can be obtained from local banks, credit agencies, and tradespeople.

#### Desirable Information

Briefly, the following information will be of assistance: purchaser's age; residence and business addresses; previous experience with credit purchases; nature of his business; business or employment record; bank account; amount of income and when received; amount and value of other property; business and character references; and facts as to the number of dependents, to determine whether a purchaser's income is sufficient to support his family and maintain and pay for the car.

Such information should be amplified in instances where the vehicle to be purchased is a commercial one to be paid for out of the earnings of the vehicle. It is of vital importance that the conditions under which the vehicle is to operate be ascertained in order to form a conclusion as to the possibility of the vehicle being able to earn sufficient to support the purchaser and his family as well as keeping up the payments.

After completing such investigation as is called for, the

dealer is prepared to decide whether or not the purchaser measures up to the two requirements:

1. Can the purchaser pay as he agrees?
2. Will he faithfully carry out the obligation?

No credit sale should be made unless an affirmative decision is made to both requirements. It is a good plan for the dealer to keep a record of the degree of credit risk in each case, so that speculative or less desirable credit risks may be kept to a minimum.

Where a credit is not entirely satisfactory, it may be strengthened by an additional endorser or guarantor. If a guaranty or endorsement is required from a third party, the same care should be exercised in checking the credit of the guarantor and endorser as of the purchaser.

#### Dealer Should Retain Interest in Car

One of the strong elements of protection to the dealer in time sales is the security of the car itself. In the United States of America, in practically all cases of time sales, the dealer retains an interest in the car until the purchase price has been paid. This security is usually in the form of a conditional sale contract or a chattel mortgage. In Great Britain a hire-purchase agreement is used. Sometimes the security document is supported by one or more promissory notes, judgment notes, bills of exchange, or other evidences of debt, but this is not a universal practice and depends upon the legal requirements of the community. Where the law contains provisions for filing or registering security documents, the dealer should, when feasible, take advantage of this additional protection.

It is good business also to require insurance against the common hazards to the motor car over which there can be no control. Otherwise, if the property is destroyed or disappears, the security documents may have no value whatever. When insurance is required, the policy should cover both the dealer's and purchaser's interests and should be held in the dealer's possession.

#### Insurance Not Substitute for Credit

The protection outlined above should never in any case be used as a substitute for the purchaser's ability and willingness to pay. The credit of the purchaser, both as to the financial and moral hazard, should always be satisfactory regardless of the security. A poor credit risk remains a poor credit risk even after security documents and insurance have been obtained, and will usually result in an unprofitable transaction. The security documents serve to mitigate the results of a mistake of credit judgment and to impress the purchaser with the necessity of carrying out his contract to avoid losing his car. The insurance policy merely protects the dealer and purchaser from losses over which they have no control.

Profits depend to a considerable degree upon the promptness with which capital can be turned over. Frequent turnover of capital requires prompt collections. Careful passing of credits will normally go far to insure prompt collections. The experience of our company demonstrates that in normal times approximately ninety percent of the installments can be collected without special effort, and only about five per cent of the installments require real collection work. Under the most favorable conditions, however, a certain amount of collection effort is necessary. Intelligent attention should be given to developing an efficient collection system. This will avoid expense and a wastage of the profits of the business. Accurate accounting records will reduce collection difficulties. Know-

*The credit market for motor cars has been developed to some extent in practically all countries of the world, but has probably reached its greatest development in the United States. In this country the potential market for motor cars is approximately 90 per cent a credit market in the low priced cars and 50 per cent a credit market in the higher priced cars. Some dealers today are completely exhausting this market and others only partially so. In the country as a whole it is hard to give an accurate estimate, but general opinion indicates that probably 75 per cent of all cars are sold on a credit basis.—From Mr. Cooper's address.*



ing how much, and when, to collect is a vital factor in good collections.

When an account becomes past due, the cause should be found out at once. If it is one of those instances where the purchaser has misstated the facts and it is plainly evident that he cannot possibly continue the payments, it is much better to repossess the car and dispose of it while it is in good condition, instead of allowing the purchaser to continue driving it. Sometimes the worst debtors can be made to pay by temporary repossession of their cars. Every day after default the relation between the indebtedness and the value of the car becomes more unfavorable. A firm policy with purchasers is productive of the best results.

When the purchaser sees earnest effort to collect and real intention to repossess his car unless he pays, he will make every effort to respond. Usually the purchaser's inability to pay is a temporary condition of financial stress, and if he is required to exert himself to pay the single installment at the time, the balance of the contract usually pays out satisfactorily. It is a good general rule to follow, either to collect the installment or repossess the car before the maturity of the next installment. Accumulating defaulted installments creates an impossible situation for both dealer and purchaser. A liberal policy should, of course, be adopted in meritorious cases, but our experience has been that these cases are limited in number.

If a purchaser defaults on one payment, he is apt to default on subsequent payments. When a defaulted installment is collected, therefore the purchaser should be impressed with the necessity of making all subsequent payments promptly.

#### Prompt Collections Reduce Losses

Prompt collections are a most vital factor keeping credit losses to a minimum. A liberal but intelligent credit policy combined with prompt collection will sell more cars that stay sold and will accumulate more profit than a restrictive credit policy combined with lax collections.

The laws of the various jurisdictions play an important part in the extent of the dealer's protection in time sales. These laws should be carefully examined to determine the available rights and remedies on the subjects of guarantors, endorsers, security documents, insurance, collections, and the repossession of the cars sold.

It is a sound business practice for a merchant selling any commodity on time to set up out of his monthly profits a reserve for credit losses, based on the experience over a period of years sufficient to include varying conditions. In lines of business which have been established for many years, the normal credit ratio is known. In the automobile business a normal loss ratio has not yet been definitely determined. Credit losses on time sales are very frequently confused with operating losses resulting from improper merchandising methods, chiefly in connection with the used or second-hand car. Allowing inflated values on cars taken in trade or part exchange; accumulating a large stock of such cars; selling cars at inflated values; requiring an insufficient or no down payment; taking notes for the down payment; allowing too liberal terms; delivering the car in poor mechanical condition—are all evils which have to some extent existed in the merchandising of the used car by the average dealer. The time sale in which one of these factors is present will undermine the transaction, make a dissatisfied purchaser, and usually cause a credit loss.

Unsound methods will always influence loss ratios. The experience on new cars will be better than that on used cars, chiefly due to a difference in selling methods. From such analysis as we have been able to make, it is our opinion that, if sound merchandising methods are followed, a dealer's credit loss should not exceed, on an average, one-half ( $\frac{1}{2}$ ) of one percent (1%) of the amount of time sales. Many dealers who have kept accurate records and analyzed the results of their credit business show a much smaller loss ratio.

One of the difficulties that faces a dealer in developing the credit market is the problem of disposing of the retail notes or receivables that result from their class of business. Some dealers are in such a strong capital position that they are able to carry their retail receivables with their own cash resources.

This is an ideal position from the marketing standpoint because it gives the dealer, at all times, control of the relations with his customers. This policy should be adopted providing the dealer is able to make a satisfactory return on his capital and it does not tie up his resources to the point of hindering the normal expansion of his business. It is usually advisable, however, to discount these notes or receivables with some outside agency.

The first institution to which the dealer should look for this accommodation is his local bank. Every dealer should endeavor to build himself into an independent financial position in his community and should have a strong banking connection. Our experience has been that, generally speaking, all banks, both foreign and domestic, are very anxious to extend this accommodation to a dealer who conducts his business along sound merchandising lines and keeps his finances in a stable condition.

There are always a few banks in every community that are slow to respond to new developments, but at the present time they are in the decided minority as far as their attitude towards time financing of motor cars is concerned. Liberal arrangements have been made by banks in many European countries in rediscounting retail notes or receivables for motor car dealers. The same is true of many other countries. The favorable reaction to this class of business in the United States and Canada is almost universal. It is probably true that all that is necessary with any bank in any country is a conviction that the dealer himself is in a stable condition and is employing sound merchandising practices.

Another outlet for retail notes or receivables which has come into prominence in the last few years has been the independent finance company. The growth of the finance company has been the result of several causes. A lack of proper understanding by the banks in the early stages of the nature of the business, heavy seasonal demands for money in various countries, and the specialized nature of the credit and collection machinery employed to handle the business, gave the finance company its opportunity. Today a very large percentage of the retail notes or receivables in the United States are rediscounted by finance companies. These companies furnish a specialized service in credits and collections, employ uniform methods and generally act as an aid to the dealer in controlling this class of business. In foreign countries where a large volume of business is in sight, opportunities may exist for finance companies to function. They are already functioning in some foreign countries, but the main reliance for the dealer in developing his credit market will be in his local bank.

#### Dealer Required to Endorse Transaction

In discounting his notes or receivables with his local bank or finance company a dealer will be required to endorse or guarantee the transaction upon which he wishes to raise funds. This requirement is a traditional practice. Normally the merchant merchandises the goods, makes the merchandising profit, and takes the merchandising risk; the banker furnishes the funds, makes a banking profit, and takes the banking risk. This is the usual division of functions with most banks and finance companies. There are some finance companies, however, which discount retail notes or receivables without the dealer's endorsement. This so-called non-recourse service, however, even with those companies that furnish it, is limited in its scope. It is usually restricted to certain limited areas such as congested Metropolitan sections, is available for only certain makes of cars, usually does not apply to second-hand or used cars, and frequently is limited to certain classes of credit, the dealer being required to endorse certain risks.

In order to determine the correctness of either method of financing retail sales we should endeavor to differentiate between the functions of the dealer and finance company or banking institution.

Briefly stated, the function of the dealer is to merchandise motor cars and the function of the finance company is to furnish funds. The larger part of the market for motor cars is a credit market and the selection of the class of credit risks to whom the dealer will sell constitutes one of the more important functions of his business. The selection of the risks determines the extent of the dealer's market. If the control of this func-

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# How Valves Are Timed

*Most Engines Have Markings to Guide the Mechanic—Fundamental Principles Explained—Chart Gives Complete Data*

By PAUL DUMAS

**U**NDER ordinary conditions the job of timing valves is a very simple operation because practically all automobile engines have the flywheel marked with the necessary data. In addition to timing marks on the flywheel most engines have the timing gears or sprockets marked for the correct meshing point. In cases where the flywheel marks are not understandable, or where the position of the flywheel relative to the crankshaft has been changed, the mechanic must fall back on the fundamental rules governing the timing of engine valves.

Among the flywheel markings often used are the following:

"I. C." when stamped on the flywheel means "inlet valve closed." It should be remembered that when this mark lines up with the pointer or datum point that the inlet valve should have just reached its seat. In other words, the "I. C." and "E. C." designate the time at which the valve has just completely closed and not the point where it has started to close.

"I. O." means that the inlet valve on some certain cylinder has just left its seat. All markings designed to indicate the opening points of either inlet or exhaust valves are based on the point where the valve has just started to rise from its seat, and not when it has reached full open position.

"I. C." is a mark often used to designate the time when the inlet valve should have just closed fully on its seat.

"E. C." designates for the exhaust valve what "I. C." does for the inlet. It means that the exhaust valve has just fully closed.

There is no absolute standardization of the markings used on the flywheel to indicate the top and bottom dead center positions of the piston in the various cylinders, and as abbreviations are always used the mechanic sometimes becomes confused. Among the markings most frequently used are the following:

1. U.D.C.—Which means "Upper dead center."
2. T.C. Which is the abbreviation for "top center," but which means the same as U.D.C.
3. T.D.C. Which means "top dead center," which is of course the same as first and second abbreviations mentioned.
4. L.C. Which is the abbreviation for "lower center."
5. L.D.C. Which is the abbreviation for "lower dead center," which is exactly the same as "L.C."
6. C. Which is the abbreviation used

for both top and bottom center positions.

7. CENTERLINE. Which is a mark also used for both top and bottom centers.

8. Ign. Which means "ignition timing point."

Accompanying any of the above markings is usually one or more numerals, such as "U.D.C. 1-4," or "T.C. 3-5," etc., indicating that the center position refers to the cylinders indicated by the numerals. Thus if we had a flywheel marked "T.C. 1-4" it means that when this mark is under the pointer the pistons in both No. 1 and No. 4 cylinders are at top or upper dead center position of their stroke.

## Tappet Adjustment Is the First Operation in Valve Timing

In order to correctly time the valves of an engine it is necessary that the tappets be first set to the clearance or gap recommended by the builder. On the general run of engines this means that the piston for each cylinder should be brought successively to the top center position on the compression stroke. Starting with the first cylinder bring the piston to top of compression stroke and then adjust the exhaust and inlet tappet to .004, .006 or whatever clearance is recommended by the engine maker. When you have done this on the first cylinder proceed to the next and repeat the same operation. On some engines such as the Cadillac eight cylinder types up to model V-63 and the Lincoln it is necessary to make the tappet adjustment when the camshaft is in a certain position relative to the valve.

In other words, due to the contour of the cams the setting for clearance must be made when a certain small portion of the cam face is in contact with the bottom of the valve lifter. The procedure for the Lincoln is as follows:

The cylinder center firing lines are marked on the flywheel and clutch driving ring. Immediately to the right of each center line is marked the letter "E" and to the left the letter "I." This marking indicates the setting point for the exhaust and inlet valves for that particular cylinder. These markings may be readily seen by removing the hand hole cover on the top of the clutch hous-

ing. Removing this cover also exposes the pointer which indicates the markings on the clutch ring only.

The upper dead center for cylinders 1 and 5 is indicated by 1/5 Fig. 2. "I" which appears approximately 1 1/4 in. distant from the left of each of the four groups of cylinder center firing lines indicates the position for setting the inlet valve clearance.

"E" which appears approximately 1 1/4 in. to the right of each of the four groups of cylinder firing center lines indicates the position for setting the exhaust valve clearance.

"RET" which appears only once on the clutch driving ring indicates the position for setting the spark. The spark is set in its fully retarded position.

To make the actual tappet setting turn the engine over with the compression cocks open. Hold your finger over the cock for No. 1 cylinder and when the piston in No. 1 is at top of the compression stroke stop turning. Now observe position of hand crank. Continue turning slowly slightly less than one complete revolution. This will place the piston approximately on top center of the exhaust stroke, but continue turning slowly until pointer indicates that piston is at exact top center. With a piece of chalk mark this position over the stamped mark and turn the engine further in the same direction until the letter "E" comes under the pointer. This will be the exact position for setting the tappet clearance of that particular exhaust valve.

To set the inlet tappet of the same cylinder continue turning in the same direction almost two complete revolutions or until the letter "I" to the left of the same center mark comes under the pointer.

Cadillac eight cylinder engines up to but not including the model V-63, made use of a camshaft with only eight cams for the actuation of the sixteen valves. This construction necessitates that the tappet clearance be set when bottom of valve lifter is on a certain portion of the back of the cam. The procedure for setting the tappets on these engines is as follows:

Open the compression cocks and turn the engine by hand until the valve that you intend to adjust has just seated. Then turn the flywheel further by hand in the same direction 1 1/2 in. on the flywheel. The cam is then in the correct position for adjustment of the tappet clearance. This applies to both inlet and exhaust valve tappets.

(Continued on page 25)

### Symbols used in the accompanying tables are:

- A. T. C.—after top center.
- B. T. C.—before top center.
- T. C.—top center.
- A. L. C.—after lower center.
- B. L. C.—before lower center.



# Valve Timing and Recommended Tappet Clearance for American Passenger Car, Truck, Tractor and Marine Engine, 1922 to 1924, Inclusive

Car, Make and Model	Inlet Valve Opens	Inlet Valve Closes	Exhaust Valve Closes	Exhaust Valve Opens	Tappet Clearance and Whether Made on Hot or Cold Engine
Apperson, 6-cyl.	06 A. T. C.	42 A. L. C.	04 A. T. C.	45 B. L. C.	Exhaust .006 to .008; Inlet .004 adjustment to be made when engine is hot and running
Apperson Eight, All models	15 A. T. C.	45 A. L. C.	10 A. T. C.	55 B. L. C.	Same as for 6-cyl.
Buick Six, 1924	0.°50' B. T. C.		32.°10' A. T. C.		Both .006 to .008; hot engine
Buick Four, 1924	22.°10' A. T. C.	45.°10' A. L. C.	09.°10' A. T. C.	53.°50' B. L. C.	Both .010 hot
Cadillac, V-63	On T. C.		On T. C.		Exhaust .006
Chevrolet Superior	16 A. T. C.		16 A. T. C.		Inlet .004 cold
Cleveland Six 924	06 B. T. C.		15 A. T. C.		Exhaust .006 hot
Cunningham 8-cyl. All models	02 A. T. C.	40 A. L. C.	05 A. T. C.	53 B. L. C.	Inlet .004 hot
Dodge, 4-cyl.	10 A. T. C.		08 A. T. C.		Both .007 hot
Dorris Six, 1922 and later	10 A. T. C. or .063" piston travel after T.C.	45 A. L. C.	10 A. T. C.	45 B. L. C.	Both .004 hot
					Exhaust .005 hot
					Inlet .003 hot
Duesenberg Straight 8, all models	½" on fly-wheel B. T. C.		1¼" on flywheel A. T. C.		Exhaust .011
Durant A-22, 1922 and later	16 A. T. C.	52 A. L. C.	16 A. T. C.	40 B. L. C.	Inlet .006 hot
Essex Six, 1924	07 A. T. C.	50 A. L. C.	08 A. T. C.	55 B. L. C.	Both .008
Flint, 6-cyl., all models	10 A. T. C.	35 A. L. C.	05 A. T. C.	45 B. L. C.	Room temp.
Franklin, Series 10	On T. C.		25 A. T. C.		Same as Hudson
Gray, 4-cyl. 1922-24	07½ A. T. C.	52½ A. L. C.	05½ A. T. C.	39½ B. L. C.	Both .010 cold
Haynes, 1924, 6-cyl. Type 60	06 A. T. C.		04 A. T. C.		Both .006 to .008 hot
H. C. S., 4-cyl.	07 A. T. C.		04 A. T. C.		Exhaust .008
Hudson Super Six, 1922-1924	07 A. T. C.	42 A. L. C.	08 A. T. C.	55 B. L. C.	Intake .004 hot
					Both .006 hot
					Exhaust .004 to .005
					Inlet .002 to .003
					hot engine
Hup Series R, After Car No. R.100,000	06 A. T. C.	46 A. L. C.	08 A. T. C.	40 B. L. C.	Inlet .005, Exhaust .006; hot; and with engine running
Jewett, 6-cyl. All models	On T. C.		10 A. T. C.		Exhaust .010 hot
Lafayette, 8-cyl. models	On T. C.	46 A. L. C.	On T. C.	46 B. L. C.	Intake .006 hot
Lincoln V-8, 1922 and later	*02½ B. T. C.	46 A. L. C.	On T. C.	48 B. L. C.	Both .003 cold
Locomobile, 6-cyl.	14 B. T. C.		19 A. T. C.		Both .002 to .003
McFarlan, Big 6	3½ B. T. C.	32½ A. L. C.	11½ A. T. C.	40½ B. L. C.	Cold engine
Marmon, Model 34, 1922-24	On T. C.		06 B. T. C.		Exhaust .004
Nash 4 and 6-cyl., 1922 and later	15 A. T. C.		10 A. T. C.		Inlet .002 hot
Oakland, 1924, 6-cyl.	05 A. T. C.		05 A. T. C.		.010 cold
Oldsmobile, 1924, Model 30	05 A. T. C.	50 A. L. C.	03 A. T. C.	42 B. L. C.	Both .004 to .006 hot
Overland, 1922-24	12° A. T. C.	35 A. L. C.	10 A. T. C.	45 B. L. C.	Both .010 hot
Packard, Single Six	09 A. T. C.	42 A. L. C.	04 A. T. C.	47 B. L. C.	Both .004 to .005
Packard, Single Elght	10 A. T. C.	45 A. L. C.	05 A. T. C.	50 B. L. C.	Hot engine
Paige, 6-cyl.	12 A. T. C.		8 A. T. C.		Exhaust .006, Inlet .004; Room temp.
Peerless, 8-cyl. 1922 and later	32 B. T. C.	60 A. L. C.	12 A. T. C.	80 B. L. C.	Both .004 hot
Premier, 6-cyl. 1920-1924 inclusive	10 A. T. C.	45 A. L. C.	05 A. T. C.	46 B. L. C.	Both .004 hot
					Exhaust .008 hot
					Inlet .006 hot
					Both .008 hot
					Exhaust .014 hot
					Inlet .014 hot

\*See text for tappet adjustment instructions.

## Complete Valve Timing Data

Car, Make and Model	Engine, Make and Model	Inlet Valve Opens	Inlet Valve Closes	Exhaust Valve Closes	Exhaust Valve Opens	Tappet Clearance and Whether Made on Hot or Cold Engine
Reo, 6-cyl., 1924		On T. C.	69°30' A. L. C.		50.°30' B. L. C.	Exhaust .004 Inlet .002; room temp.
Revere, 4-cyl.		7 A. T. C.		11 A. T. C.		Both .005 hot
Rickenbacker, 6-cyl., all models		On T. C.		05 A. T. C.		Both .008 hot
Rollin, 4-cyl.		02 A. T. C.		03 A. T. C.		Both .0035 to .004 Hot engine
Star, 4-cyl. All models		04 A. T. C.	46 A. L. C.	01 A. T. C.	41 B. L. C.	Both .006; room temp.
Stearns-Knight		04 A. T. C.	44 A. L. C.	04 A. T. C.	50 B. L. C.	Knight engine
Sterling-Knight, 6-cyl., all models		10 A. T. C.		06 A. T. C.		
Stutz, 4-cyl., Model K.L.D.H.		07 A. T. C.	57 A. L. C.	07 A. T. C.	71 B. L. C.	Both .006 hot
Stutz, 6-cyl., Model 690		10 A. T. C.	50 A. L. C.	10 A. T. C.	40 B. L. C.	Both .006 to .008 hot
Stutz, 6-cyl. Model 695		10 A. T. C.	45 A. L. C.	05 A. T. C.	45 B. L. C.	Both .009 to .010 hot
Westcott D-48, 6-cyl., Models 1922 and later		2½ A. T. C.	28 A. L. C.	10 A. T. C.	40 B. L. C.	Exhaust .004 to .005 Inlet .003 hot
Westcott D-48		10 A. T. C.	28 A. L. C.	02½ A. T. C.	40 B. L. C.	Same as C-44
Templar, 6-cyl.		10 A. T. C. or 1.18 in. on flywheel		10 A. T. C. or 1.18 ins. on flywheel		Both .002 to .004; adjustment made with motor hot and spark retarded
Wills St. Claire, 8-cyl., 1922-24		10 A. T. C.	35 A. L. C.	5 A. T. C.	40 B. L. C.	Exhaust .012 Inlet .006; room temp.
Willys-Knight, 1922-24		15 A. T. C.	50 A. L. C.	08 A. T. C.	50 B. L. C.	Knight engine
Winton, Model 40, 6-cyl.		After top center when top of piston is 7/64" from top of the cylinder.		After T. C. when top of piston is 1/16" from top of cylinder		Exhaust .005 Inlet .003; room temp.

### STOCK ENGINES USED IN AMERICAN PASSENGER CARS, TRUCKS AND INDUSTRIAL MACHINERY

Continental 8-R six-cylinder engines used in following passenger cars: Case, Model X; Columbia Big Six; Elcar 6-60; Hanson 66, Moon 6-58 and Davis 81.

12 A. T. C.	40 A. L. C.	08 A. T. C.	40 B. L. C.	Exhaust .004 to .005 Inlet .003 hot
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Continental six-cylinder engine Model 7U, used on passenger cars as follows: Anderson, Auburn, 43, Barley, Columbia Light 6, Davis Model 71, Elcar 6-50, Moon 6.40.

08 A. T. C.	28 A. L. C.	07 A. T. C.	40 B. L. C.	Ex. .006 hot Intake .004 hot
-------------	-------------	-------------	-------------	---------------------------------

Wisconsin engines used in trucks, passenger cars, motor boats and tractors.

SU—4 cyl.	05 A. T. C.	05 A. T. C.		Both .008 hot
TAU 4 cyl.	10 A. T. C.	10 A. T. C.		Ex. .006 Inlet .004 hot
UAU 4 cyl.	Timing and tappet clearance same as for TAU			
VAU 4 cyl.	Same timing and tappet clearance as for model UAU			
NU 4 cyl.	05 A. T. C.	05 A. T. C.		Ex. .006 Inlet .004 hot Same as model NU
RAU 4 cyl.	15 A. T. C.	10 A. T. C.		
RBU 4 cyl.	Same timing and tappet clearance as model RAU			
M 4 cyl.	Same timing and tappet clearance as model RAU			
P 6 cyl.	05 B. T. C.	10 A. T. C.		Ex. .010 Inlet .008 hot

Falls six-cylinder valve-in-the-head engines Models T-8000 and DT-8000, used in Dort Six, Elgin Six, Apperson Six, Courier and others.

6 cyl. I head	06 A. T. C.		04 A. T. C.	Both .008 to .010 either hot or cold
8 cyl.	10 A. T. C.	46 A. L. C.	On T. C.	49 B. L. C. Same as for 6 cyl.



# Complete Valve Timing Data

Engine, Make and Model	Inlet Valve Opens	Inlet Valve Closes	Exhaust Valve Closes	Exhaust Valve Opens	Tappet Clearance and Whether Made on Hot or Cold Engine
Northway engines, four-cylinder, models 80, 84 and 88, used in trucks and tractors, and model 311 Vee, eight-cylinder, used in Cole.					
80—4-cyl.	20 A. T. C.		On T. C.		Both .010 to .012 cold
82—4 cyl.	Timing and tappet clearance same as for model 80				
84—4 cyl.	Timing and tappet clearance same as for model 80				
88—4 cyl.	Timing and tappet clearance same as for model 80				
311—8 cyl. Vee	15 A. T. C.		10 A. T. C.		Both .003 to .005 cold
Waukesha four-cylinder engines used in various makes of trucks, tractors, industrial machinery, taxicabs, etc.					
EU 4 cyl.	10 A. T. C.		15 A. T. C.		Ex. .012 to .015 Inlet .004 to .006 cold
DU 4 cyl.	Timing and tappet clearance same as for EU				
FU 4 cyl.	Timing and tappet clearance same as for EU				
CU 4 cyl.	Timing and tappet clearance same as for EU				
Y 4 cyl.	Timing same as EU				Ex. .008 to .010 Inlet .004 to .006 cold
YA 4 cyl.	Timing and tappet clearance same as for Y				
Z 4 cyl.	Timing and tappet clearance same as for Y				
Four-cylinder Lycoming engines, used in Elcar Four, Gardner, Dort Four, Kelsey, Seneca and various light trucks.					
CF 4 cyl.	On T. C.		05 A. T. C.		Both .004 to .006 hot
CE 4 cyl.	Timing and tappet clearance same as for model CF				
Weidely six-cylinder engines, used in Auburn and H. C. S. passenger cars.					
RS I head	10 A. T. C.		10 A. T. C.		Both .003 to .005 hot
R I head	Timing and tappet clearance same as for model RS				

(Continued from page 22)

When all tappets have been adjusted to the recommended clearance the mechanic is in a position to either check the timing or retune the valves if necessary. In case the flywheel is incorrectly installed or where there are no valve timing marks on it the mechanic can do an accurate job of timing by following the data sheet and conversion table included in this article. Under the conditions just mentioned it is readily seen that it will be necessary to convert the timing information given in degrees to distance on the flywheel.

To use the conversion chart proceed as follows:

1. First determine either the diameter or circumference of the flywheel.

2. Bring the No. 1 piston to top dead center position and then mark the flywheel at this point.

3. Refer to the data sheet for the timing in degrees and using the exhaust valve closing point as a basis convert the degrees to inches on the flywheel.

4. The conversion is accomplished by reading down the left hand column until you find the line that has the numeral indicating the diameter of the flywheel on the particular engine. Suppose we have an engine with a 15-in. diameter flywheel we follow down and stop at the numeral fifteen shown in the heavy type.

Suppose that the data sheet shows the exhaust valve should open 10 degrees after top center. To find the inch equivalent to ten degrees we follow across the top line to the column marked 10° and read down until we come to the line marked "15" at the extreme left column. The figure is 1.31 inches which means that the flywheel should be turned 1.31 inches further than top center in the direction of rotation, the camshaft turned so that the exhaust valve has just closed on No. 1 cylinder and then the cam and crankshaft gear meshed.

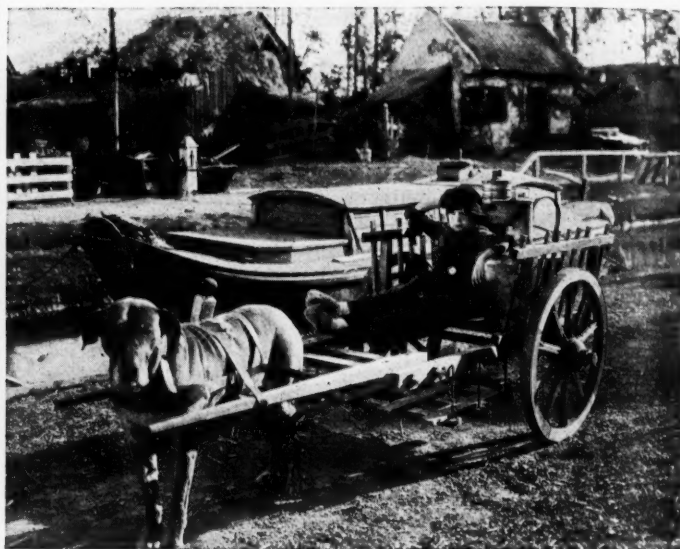
Diam. wheel	Circum.	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	20°	30°	40°	50°
12	37.699	10	.21	.31	.42	.52	.63	.73	.84	.94	1.05	2.09	3.14	4.19	5.24
1/4	38.485	.11	.21	.32	.43	.53	.64	.75	.86	.96	1.07	2.14	3.20	4.27	5.34
1/2	39.270	.11	.22	.33	.44	.55	.66	.77	.87	.98	1.09	2.18	3.27	4.36	5.46
3/4	40.055	.11	.22	.33	.45	.56	.67	.78	.89	1.00	1.11	2.22	3.33	4.45	5.56
13	40.841	.11	.23	.34	.45	.57	.68	.79	.91	1.02	1.13	2.26	3.40	4.54	5.67
1/4	41.626	.12	.23	.35	.46	.58	.69	.81	.93	1.04	1.16	2.31	3.47	4.63	5.78
1/2	42.412	.12	.24	.35	.47	.59	.71	.82	.94	1.06	1.18	2.35	3.53	4.71	5.89
3/4	43.197	.12	.24	.36	.48	.60	.72	.84	.96	1.08	1.20	2.40	3.60	4.80	6.00
14	43.983	.12	.24	.37	.49	.61	.73	.86	.98	1.10	1.22	2.44	3.66	4.89	6.10
1/4	44.768	.12	.25	.37	.50	.62	.75	.87	.99	1.12	1.24	2.48	3.73	4.95	6.21
1/2	45.553	.13	.25	.38	.51	.63	.76	.89	1.01	1.14	1.27	2.53	3.80	5.07	6.34
3/4	46.338	.13	.26	.39	.51	.64	.77	.90	1.03	1.16	1.29	2.57	3.86	5.15	6.44
15	47.124	.13	.26	.39	.52	.65	.79	.92	1.05	1.18	1.31	2.62	3.93	5.25	6.55
1/4	47.909	.13	.27	.40	.53	.66	.80	.93	1.06	1.20	1.33	2.66	3.99	5.31	6.65
1/2	48.695	.14	.27	.41	.54	.68	.81	.95	1.08	1.22	1.35	2.70	4.05	5.40	6.76
3/4	49.480	.14	.27	.41	.55	.69	.82	.96	1.10	1.24	1.37	2.75	4.12	5.49	6.87
16	50.265	.14	.28	.42	.56	.70	.84	.98	1.11	1.26	1.40	2.79	4.19	5.59	6.98
1/4	51.051	.14	.28	.43	.57	.71	.85	.99	1.13	1.28	1.42	2.84	4.25	5.68	7.10
1/2	51.836	.14	.29	.43	.58	.72	.86	1.01	1.15	1.29	1.44	2.88	4.31	5.76	7.20
3/4	52.622	.15	.29	.44	.59	.73	.88	1.02	1.17	1.31	1.46	2.92	4.38	5.83	7.30
17	53.407	.15	.30	.44	.59	.74	.89	1.04	1.18	1.33	1.48	2.96	4.44	5.93	7.40
1/4	54.192	.15	.30	.45	.60	.75	.90	1.05	1.20	1.35	1.50	3.00	4.51	6.02	7.53
1/2	54.978	.15	.31	.46	.61	.76	.92	1.07	1.22	1.37	1.53	3.05	4.56	6.11	7.63
3/4	55.763	.15	.31	.46	.62	.77	.93	1.08	1.24	1.39	1.55	3.10	4.65	6.20	7.73
18	56.549	.16	.31	.47	.63	.79	.94	1.10	1.25	1.41	1.57	3.14	4.71	6.29	7.88
1/4	57.334	.16	.32	.48	.64	.80	.95	1.11	1.27	1.43	1.59	3.18	4.77	6.37	7.95
1/2	58.119	.16	.32	.48	.65	.81	.97	1.13	1.29	1.45	1.61	3.23	4.84	6.45	8.07
3/4	58.905	.16	.33	.49	.65	.82	.98	1.14	1.31	1.47	1.63	3.26	4.90	6.54	8.18
19	59.690	.17	.33	.50	.66	.83	.99	1.16	1.32	1.49	1.66	3.32	4.97	6.63	8.30
1/4	60.476	.17	.34	.50	.67	.84	1.01	1.17	1.34	1.51	1.68	3.36	5.04	6.71	8.40
1/2	61.261	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.53	1.70	3.40	5.10	6.80	8.51
3/4	62.046	.17	.34	.52	.69	.86	1.03	1.21	1.38	1.55	1.72	3.45	5.17	6.90	8.62
20	62.832	.17	.35	.52	.70	.88	1.05	1.22	1.39	1.57	1.74	3.48	5.24	6.98	8.73
1/4	63.617	.18	.35	.53	.71	.89	1.06	1.24	1.41	1.59	1.77	3.54	5.31	7.07	8.85
1/2	64.403	.18	.36	.54	.72	.90	1.07	1.25	1.43	1.61	1.79	3.56	5.37	7.15	8.95
3/4	65.188	.18	.36	.54	.72	.91	1.09	1.27	1.45	1.63	1.81	3.62	5.44	7.25	9.05
21	65.973	.18	.37	.55	.73	.92	1.10	1.28	1.47	1.65	1.83	3.66	5.50	7.33	9.15
1/4	66.759	.19	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	3.70	5.56	7.41	9.26
1/2	67.544	.19	.38	.56	.75	.94	1.12	1.31	1.50	1.69	1.88	3.75	5.63	7.50	9.38
3/4	68.330	.19	.38	.57	.76	.95	1.14	1.33	1.52	1.71	1.90	3.79	5.69	7.59	9.49
22	69.115	.19	.38	.58	.77	.96	1.15	1.34	1.53	1.73	1.92	3.84	5.75	7.68	9.60
1/4	69.900	.19	.39	.58	.78	.97	1.16	1.36	1.55	1.75	1.94	3.88	5.82	7.76	9.70
1/2	70.686	.20	.39	.59	.79	.98	1.18	1.37	1.57	1.77	1.96	3.93	5.88	7.85	9.82
3/4	71.471	.20	.40	.60	.79	.99	1.19	1.39	1.59	1.79	1.98	3.96	5.95	7.94	9.92
23	72.257	.20	.40	.60	.80	1.00	1.20	1.40	1.61	1.81	2.01	4.02	6.02	8.03	10.03
1/4	73.042	.20	.41	.61	.81	1.01	1.22	1.42	1.62	1.82	2.03	4.06	6.06	8.13	10.13
1/2	73.827	.20	.41	.62	.82	1.02	1.23	1.43	1.64	1.84	2.05	4.10	6.15	8.21	10.23
3/4	74.613	.21	.41	.62	.83	1.04	1.24	1.45	1.66	1.86	2.07	4.15	6.22	8.30	10.35
24	75.398	.21	.42	.63	.84	1.05	1.26	1.46	1.67	1.88	2.09	4.19	6.28	8.38	10.45

Conversion Table, Hundredths of an Inch to Sixty-Fourths

01, 02	1/64	.14	9/64	.26, 27	17/64	.39	25/64	.51, 52	33/64	.64	41/64	.76, 77	49/64	.89	57/64
03	1/32	.15, 16	5/32	.28	9/32	.40, 41	13/32	.53	17/32	.65, 66	21/32	.78	25/32	.90, 91	29/32
04, 05	3/64	.17	11/64	.29, 30	19/64	.42	27/64	.54, 55	35/64	.67	43/64	.79, 80	51/64	.92	59/64
06, 07	1/16	.18, 19	3/16	.31, 32	5/16	.43, 44	7/16	.56, 57	9/16	.68, 69	11/16	.81, 82	13/16	.93, 94	15/16
08	5/64	.20, 21	13/64	.33	21/64	.45, 46	29/64	.58	37/64	.70, 71	45/64	.83	53/64	.95, 96	61/64
09, 10	3/32	.22	7/32	.34, 35	11/32	.47	15/32	.59, 60	19/32	.72	23/32	.84, 85	27/32	.97	31/32
11	7/64	.23, 24	15/64	.36	23/64	.48, 49	31/64	.61	39/64	.73, 74	47/64	.86	55/64	.98, 99	63/64
12, 13	1/8	.25	1/4	.37, 38	3/8	.50	1/2	.62, 63	5/8	.75	3/4	.87, 88	7/8	1.00	1

From Horseless Age.

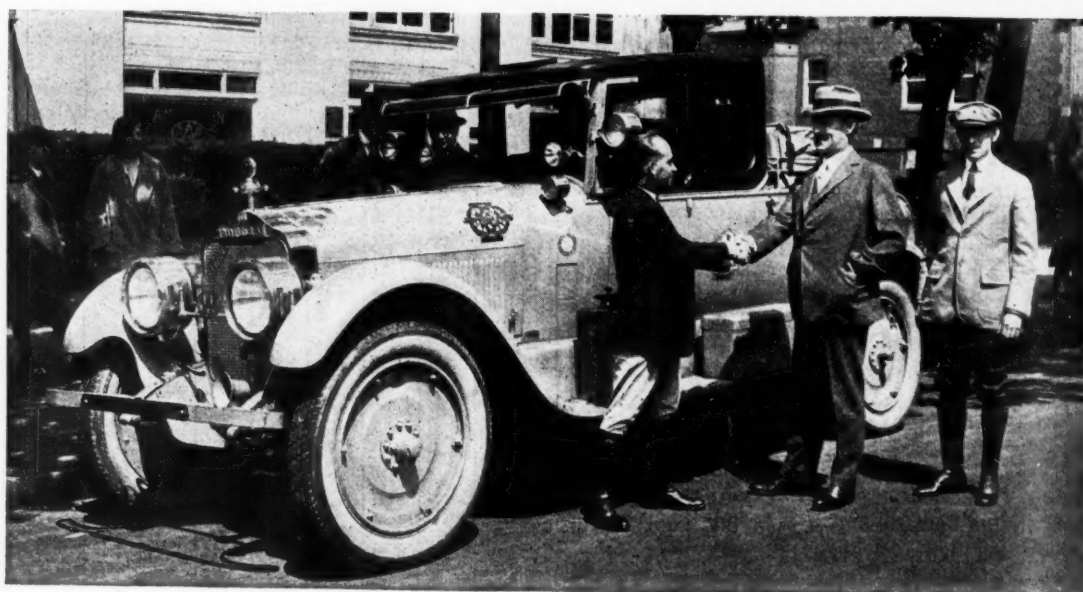
# MOTOR AGE'S PICTURE PAGES



On one side, we have Jackie Coogan on the runningboard of a Buick, on the other he is perched on the runningboard (?) of a (?)

✿ ✿ ✿

The A. A. A. Scout Car completes its eighteenth continental trip in the interest of accurate information for the motoring public. Dan J. Nee, driver, is greeted by Ernest N. Smith upon his arrival at Washington



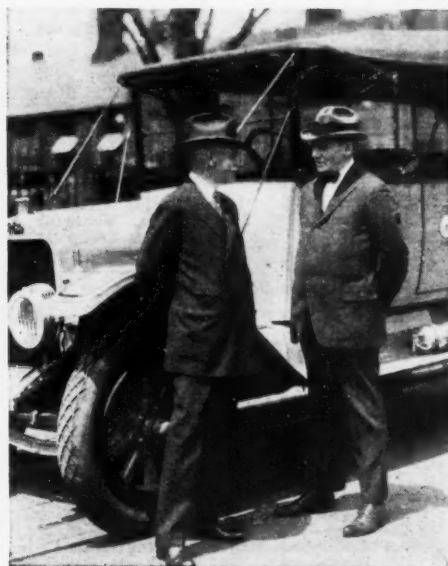
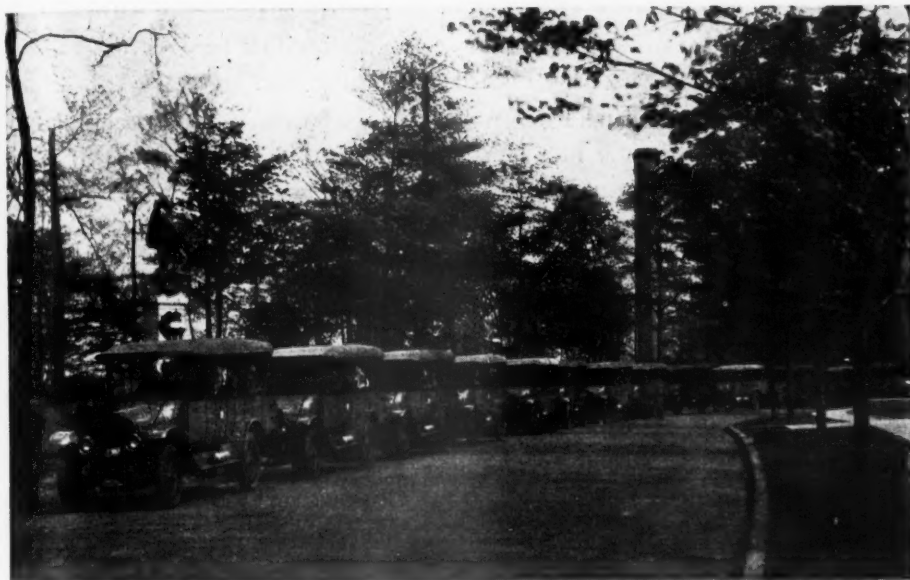
✿ ✿ ✿

Flying in a temperature of 40 below, these aviators were forced to land on a barren lake in northern Canada where they were making a forest survey. They are Pilot Kenneth Saunders and Photographer William Kahne





# S OF AUTOMOTIVE INTEREST



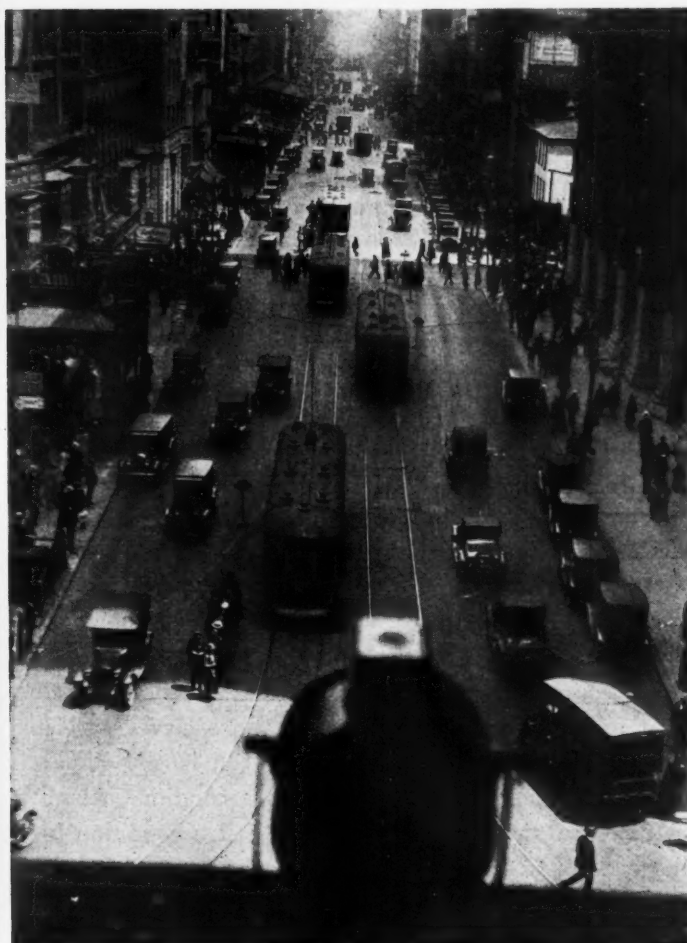
(Left) A portion of the 60 White busses which will augment the fleet of the Yellowstone Park Transportation Co. (Right) Harry W. Child, president of the Yellowstone company and Walter C. White, president of the White company



The Automobile Association of London has started a night service for motorists. Here is one of the operatives on the job



Into the Urgel Canal, upside down was the fate of this new Ford in South America—the driver and other occupants escaped unhurt after a fall from the bridge above



To light up the avenues in an emergency, these lights were installed in likely places in Philadelphia. They should prove especially effective during bandit chases and the like



Vol. XLV

Thursday, June 26, 1924

No. 26

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## Subscription Rates

United States, Mexico and U. S. Possessions.....\$3.00 per year  
 Canada.....5.00 per year  
 All Other Countries in Postal Union.....6.00 per year  
 Single Copies.....35 cents

Subscriptions accepted only from the Automotive Trade

Entered as second-class matter September 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.

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 Member, Associated Business Papers, Inc.

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Mallers Building, 5 South Wabash Avenue, Chicago

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## Are Cars Bought or Sold?

AN interesting debate was held the other day by the retail sales managers' bureau of the Cincinnati Automobile Dealers' Association on the question of whether or not new automobiles are "bought" by the customer or "sold" by the salesman. Points made by the debaters were scored by the judges and when they were added up it was found that the "bought" side was the winner with 24 points against 22 points for the "sold" side.

Of course this may only mean that the orators representing the bought side were the more clever and convincing in their argument. But we can hardly get away from the conclusion that it reflects a condition which to some extent, at least, is true. Nor is it a condition to be deplored. It is recognized that every family wants an automobile and some of them want more than one. To that extent the men engaged in the distribution of automobiles do not have to do any selling.

The selling comes in persuading the prospect to buy one

kind of automobile rather than another that a rival salesman wants him to buy; in convincing him, sometimes, that he can afford to own and operate a particular type of car, or any car at all, when he may have doubts on this point; in inducing him to equip the car that he does buy with the accessories needed for comfort and safety.

In short, there is plenty of room for real salesmanship in the retail marketing of automobiles although the fundamental desire to own does not have to be created except in rare cases.

It might be more interesting, and more profitable, to have a debate on the question of who buys and who sells used cars.

## Horace M. Swetland

WHEN death came to Horace M. Swetland, organizer and head of the company which publishes MOTOR AGE, it closed earth's door on a life which has been useful, eventful and inspiring far beyond the ordinary lot of men. From farm boy, to country school teacher, to small town banker, to publisher, he won his way to one of the most eminent places in the publishing world of the United States.

Mr. Swetland's life is a typical example of success in American business. He made a way for himself by serving others. He made those whom he served his friends and enjoyed to a ripe age the acquaintance and admiration of a great many men in the automotive industry, the publishing business and the whole wide world of business.

To the automotive industry Mr. Swetland contributed a vision of its needs in engineering and standardization, leading to the formation of the Society of Automotive Engineers; also a vision of its needs in business and technical information, which the great group of business papers he organized and directed have been supplying for years. To the business publishing industry he gave freely of his ideas and experience, leading in many of its most important cooperative movements. To American business in many ways he contributed inspiration and service. To his friends and to many hundreds of men and women who were associated with him in various enterprises he gave by the example of his own life inspiration to overcome difficulties and do worth while things.

A big man passed on when H. M. Swetland breathed his last.

## The Maintenance Department

THE official designation of the service and parts departments of all Lexington dealers and distributors hereafter will be "Maintenance department."

This announcement is made by the factory organization with the explanation that the word "service" has been very much abused in the automotive industry. The announcement continues:



"It will be our policy to operate our maintenance departments in such a manner that the name will become an asset in the sale of new cars. In short, the function of this division, as in the past, will be that of maintaining the cars of Lexington owners in as nearly perfect mechanical condition as possible."

Here is added proof of the importance of maintenance. By whatever term it may be called, the service department of the modern dealer's establishment must be recognized as on a par with the sales department, and it can be made just as profitable.

MOTOR AGE long ago pointed out that the true function of the service department is maintenance. And maintenance helps sales.

### Forsaking False Prophets

IN the manufacturing branch of the automotive industry there stands out a recent act of business sagacity that is rare these days. A great firm with a name known around the world has decided to forsake the pursuit of volume in production and devote its endeavors hereafter to quality and incidentally to profit.

The Timken Detroit Axle Co. announces that it will close and dispose of certain unprofitable plants which have been devoted to the production of axles for low and medium priced cars at competitive prices. The purpose is to put the company on a dividend paying basis. Hereafter business that must be taken at cost or less will not be accepted by this company. It will make no effort to produce all the axles required for great quantities of automobiles in the low and medium price fields.

The company has had its fill of trying to take all the business of this kind that it could get. It found that to get this business it had to cut prices to the point where no profit remained. It is openly admitted by the company in a formal statement that it was believed for a time that it paid to take this business because it helped to reduce the overhead on the profitable business, but this has been found to have been a misplaced hope.

Hereafter the company will concentrate upon production of axles for high grade passenger cars, buses and trucks and will jealously guard the quality of its product and zealously adhere to a profit-making basis.

This highly constructive step which might well be followed by others in the industry from manufacturer down to retailer.

It is outstanding recognition of the fact that profit does not always go with volume.

### A Model Motor Cop

THE road forked and the car stopped. Which way was the right one. Then the sign was seen, the route led to the left, down the hill and across the railroad tracks, but before the car could be started a motor cop had pulled up alongside.

What could it be this time?

Speeding? Hardly that. The number plates were no dustier than average. We were on the right side of the road. It was too deep, so we tried a smile and awaited the outcome.

"Where you goin'?"

The question was business-like but not unfriendly.

"To Akron," replied we.

"Follow me," said the cop.

And we did. But what was the idea? Were we pinched and on the way to the lockup? The attitude had seemed too friendly for that, and yet whoever heard of a motor cop going out of his way to do anything but bawl you out?

A truck slowed up the procession. The officer circled it, waved us to follow and sped on. We made it past the truck but as the traffic thickened we lost him. Then another surprise.

He had stopped to wait for us.

"What part of Akron were we seeking?" He would guide us there.

The answer was out. It was a new species we had never seen before and we stammered our thanks, told him we could find the way all right, then thanked him again.

A business-like nod on his part and he was on his way.

There ought to be more like him.

### For the Good of the Battery Business

THE new battery manufacturers' association which was organized early this year had a test of strength last week when it met for its first convention at Cedar Point, Ohio. The outcome was highly satisfactory to those who are interested in the progress of this particular branch of the automotive industry.

It was voted to assess membership dues of sufficient amount to enable the association to employ competent management and proceed with its objective of working for the betterment of the battery business.

A creed was adopted, an important pronouncement of which is aimed at the discouragement of misleading advertising. The battery business has suffered as perhaps no other business from false and misleading advertising. The battery business seems to have been the patent medicine field of the industry. Dozens of irresponsible firms have sprung up from time to time to offer a battery or a solution for which the most extravagant claims were made. Car owners who have had trouble with batteries, and most of them do because of neglect if for no other reason, are very susceptible to this questionable advertising, at least until they have had a taste of its bitter falsity. The result has been very harmful to the entire industry.

It is up to the battery industry through its own strong organization to save itself from disrepute and at the same time render a service to the millions of users of automobile batteries.

# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Burning Valves Steal the Power

**Q.** We have a 1923 Dodge three-quarter ton truck, which is causing us considerable trouble. The car has run 9,000 miles. It has no power and the valves have been ground five times. This always does some good at first, but only lasts about a week to 10 days. The timing has been checked several times and new rings put in about two weeks ago. Valve stem oilers were put in and yet we experience no relief. There are very few hills that we can pull on second speed with 900 lbs. in the truck, which is very unusual for a Dodge car. This car showed this condition the first day it was driven. It has a faint knock when on heavy pull as if valves do not close.—Holland Garage, Holland, Mich.

Some drivers unaccustomed to operating a Dodge car will use the choker excessively. It is even possible to leave the choker part way out and have the engine run fairly well and yet an excessive amount of fuel is being drawn into the engine and some of it is working down past the valve stems and washing the oil off. In some cases this condition causes the valve stems and guides to become worn so that they are noisy and the mechanic working on such a car will be tempted to set the tappets too close to overcome this condition. We accordingly think it possible that the tappets are set too close and would recommend your trying a setting of not less than .004 inches on the exhaust valve and .003 inches on the intake valve when the engine is hot.

#### More Clearance Than Needed

This is more clearance than is needed but will serve as a test to tell whether this is the trouble or not. If this setting of tappets gives full power to the engine but the valves are noisy then it means that the valve guides must be reamed out and valves with oversize stems installed. You say you have checked the timing. The timing of the valves should be such that the exhaust valve closes when the piston has come up on top dead center and has barely started down again. The timing of the ignition should be such that in the retard position the interrupter points just begin to separate when the piston is on top dead center. Then in the advance position the spark will occur before the piston has reached top dead center. A very lean mixture has a burning action which a normal mixture does not have and we accordingly thought that possibly the carbureter was set to give too lean a mixture but the local Dodge service station superintendent did not feel that this would be likely.

However, if there is some tendency for

### The Readers' Clearing House

**THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.**

**All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.**

**Readers' names will not be published with articles, if a request to this effect is received with the letter.**

**Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.**

**Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.**

**Addresses of business firms will not be published in this department but will be supplied by letter.**

**Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.**

the engine to pop back when the throttle is suddenly opened and the engine warm, it might be well to turn the adjustment screw a slight amount to the right, this being the screw that operates again the choker lever at the base of the carbureter. The fact that grinding the valves produces some improvement shows that the trouble is due to burning of the valves which can only be due to there being held open by the tappets or to their sticking or to an excessively lean mixture.

Read Tom Wilder's building story on page 9

### Putting Piston Rings in a Hudson Super-Six

**Q.**—What is the proper way to replace piston rings in a Hudson Super Six? Will the pistons come down through the bottom without removing counterbalances? Is it better to remove the block, that is raise it off the piston or would it be best to fit rings to each cylinder, then disconnect connecting rod and push the piston up through the top as far as the rod will let it come, so as to remove the old rings and replace with new ones?

Your last suggestions is a correct one. The cylinder head should be taken off and the oil pan should be removed from the bottom and the connecting rod disconnected. With the piston in the down position the new piston rings may be fitted to the cylinder wall after which the piston may be pushed up and the old rings taken off and new ones put on. It would not be advisable to remove the counterbalances.

**Q.**—Did the Liberty engine as used in war aeroplanes have overhead camshaft or not?

An overhead camshaft was used.

**Q.**—Is there not an unequal lapse of time between the explosion of a 60-degree V-type engine?

Yes, the angle to which the crankshaft turns is first 60 degrees and then 120 degrees. Makers of this type engine claim that this breaks up the vibration, and that inasmuch as the power impulse is overlapped anyway that it is a good construction on account of the fact that an engine of this type takes up less space. This explanation applies to the eight-cylinder 60-degree motor only. A twelve-cylinder engine with cylinders at an angle of 60 degrees would have the same time between explosions.

**Q.**—Is not the frame of the Marmon made of aluminum?—W. S. Steele, 730 Macon avenue, Canon City, Colo.

No. The Marmon bodies have been made of aluminum but the frame has always been made of steel.

#### A Question of Noises

**Q.**—Which makes the most noise, the electric carbon arc operating on direct current or on alternating current?—J. H. Delperdang, Tripp, S. Dak.

A.—The alternating current arc makes more noise than the one operating on direct current, but both of these systems of lighting have been rendered practically obsolete by high candle power Tungsten lamps. If your question has to do with some lighting arrangement on which you are figuring for your shop, we would suggest that you use Mazda-Tungsten lamps as they are both cheaper in first cost and in upkeep, also more reliable in operation.



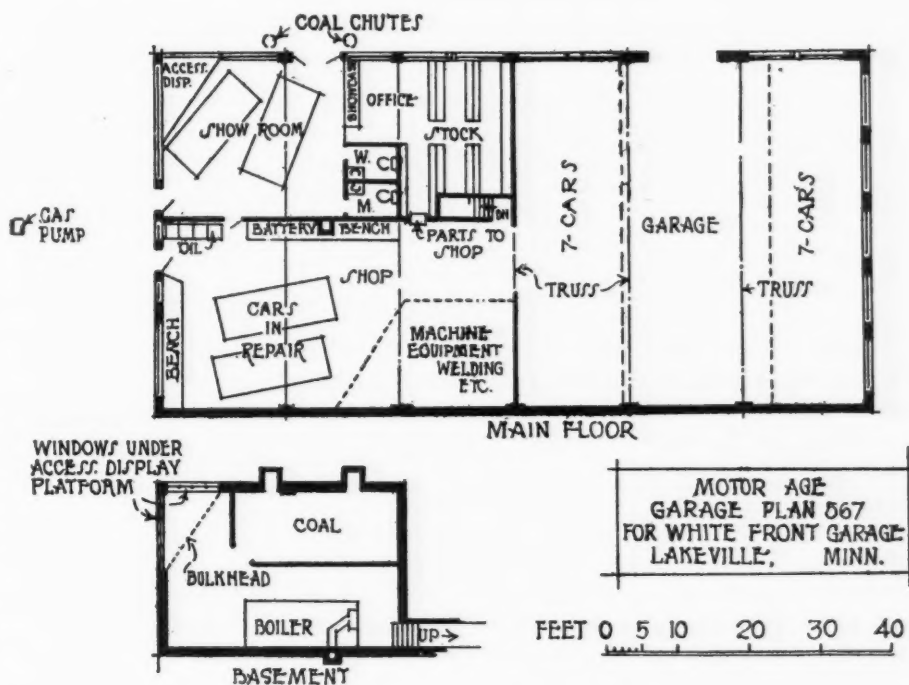
## A 50x100-Foot Garage for Lakeville, Minn.

Q.—I am going to build a garage, brick, 50 by 100 feet. It will face the west and have a street on the west side, north side and an alley in the rear. I intend to have doors 12 ft. wide both in front and rear and place gasoline fillers in front of display room at edge of sidewalk. I want to have a stock room, and display room and toilet rooms in front on one side and work shop on opposite side in front as I think it is a whole lot more convenient to have work shop in front in a small town. I want to have the battery shop and a place for oiling and greasing in the same corner.

Under the office I want a basement for furnace and coal bins. I do not intend to have any place to wash cars in the garage. What would be the best way to heat the garage? Would a hot water plant work satisfactory when the temperature gets down to 35 below zero and could you run pipes along the lower part of the wall. Is there anything you can use satisfactorily for a floor besides cement that isn't high priced as cement seems to go to pieces in a short time. What is the cheapest way of putting on a roof. What is the bracing part? If you can send a plan to me I will appreciate it very much.—Alfred Moes, White Front Garage, Lakeville, Minn.

We have drawn you a plan but have omitted the 12 foot door in front and have limited the side doors to 10 feet. 10 feet doors are in general use on all large garages and there is no object in making them 12 feet, unless you enlarge them enough for two cars to pass at once and then it would be necessary to make them at least 14 feet wide.

You will kill considerable valuable space by making a driveway clear through this building. It is really not big enough for that purpose. If you install a car entrance at front it should not be more than 7 feet wide. This will permit cars to be taken into the shop but will discourage the use of this doorway as a general entrance. We show a solid partition across the center of this building dividing the front half from the rear. By so doing you may be able to heat the front part up to 65 to 70



degrees and keep the rear or garage part as low as 40, thus saving considerable fuel, which is a feature to be considered in your country.

A further saving of considerable proportion could be had by ceiling the rooms, especially the shop, showroom and stockroom, using the lower side of the trusses to support this ceiling. We have shown the display room large enough to hold one or two cars, but as you do not say anything about cars in your letter, perhaps you only want an accessory display room. If this is the case the office, accessory and stockroom could be moved forward and the space gained, used for shop purposes.

Regarding your heating plant, steam is by all means the best for garage heating, hot water is too expensive to install and while as economical of upkeep,

is no more so than steam. Hot air is not considered advisable for garage use.

There is no reason why you cannot use wall coils but in doing so, you will have to run your returns at least, under the floor in some cases.

The only reason the cement floors go to pieces in a short time is because they are not rich enough in cement or that the gravel is of poor quality. A mixture of part cement, two of sand, and four to four and a half of crushed stone should stand any kind of punishment within reason. Be sure to use the best gravel that can be had. Bank gravel sometimes contains soft shaley and slatey stones that crush easily leaving small holes. The cement around these holes then crumbles away making the holes larger and so it goes until the whole surface is rough.

### Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

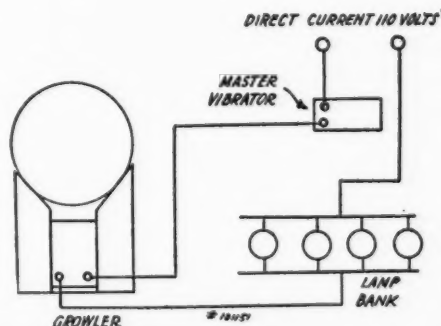
Number of men employed in repair shop.

How much of an accessory department is anticipated.

### CANNOT CHANGE DIRECT CURRENT TO ALTERNATING CURRENT

Q.—I would like to know what is the most practical method of changing direct current to alternating current to operate a growler.—L. H. Ballantyne, Second street at Taylor, Portland, Ore.

There is no way to change direct current to alternating current. It is, of course, possible to have a motor generator set where the motor runs from direct current and the generator produces alternating current, but this would be rather expensive if used to operate a growler. We would suggest your trying the connections shown in the sketch. It is necessary to have a lamp bank in or-



der to hold down the amount of current. It is also necessary to have a vibrator

of some sort in order to interrupt the current through the growler and produce the magneto changes which are necessary for testing the armature. One of the large box type Master vibrators would be suitable for this purpose.

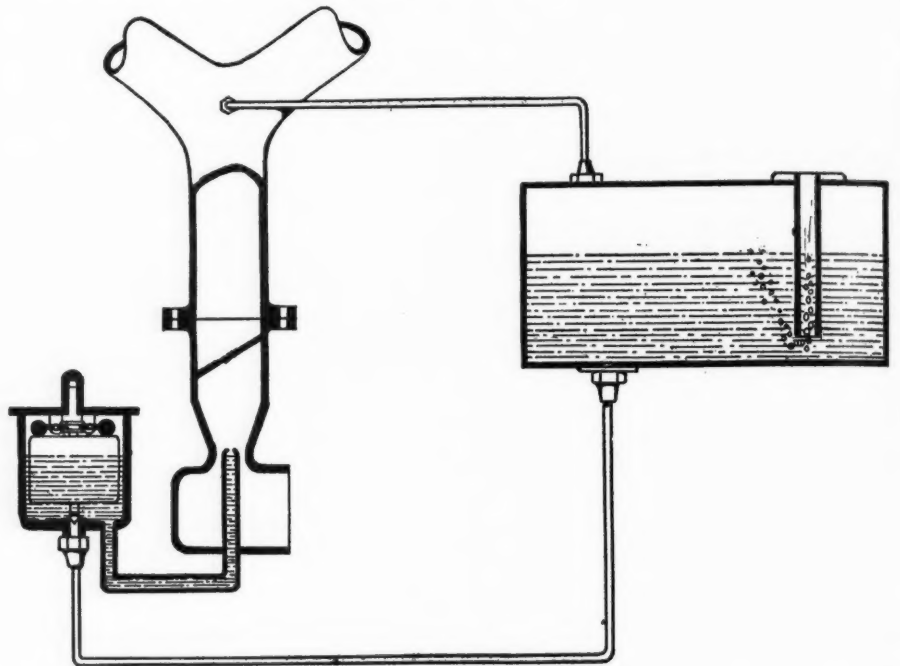
One of the old ignition relays made by Delco would also serve the purpose and it is possible that a unit of this sort may be picked up at some wrecking concern. The use of the growler in this way is not quite as satisfactory as with alternating current, but with a good Master vibrator and with the right number of lamps, which is determined by experiment, you will get fair results.

## How Is Gas Saved With This Device?

Q.—I would like to know the address of the manufacturing company that makes a gas-saving attachment answering the following description: The gas tank is sealed with a tube running from the top of the tank into the gasoline. The intake manifold is tapped and connected to the top of gas tank drawing gas from the top of the tank. The attached sketch shows the general idea.—P. O. Walter, Pompeys Pillar, Mont.

We do not know the name of the manufacturer but it is possible that some of our readers will be able to give us this information. Your drawing is reproduced so as to give the general idea and we will have to confess that we do not perfectly get the gas-saving idea. The tube extending into the gasoline would apparently eliminate to a great extent spillage of gasoline which sometimes takes place at the breather hole in the ordinary cap. Aside from this feature, however, we fail to see any advantage.

The air above the gasoline in the tank is of course charged with gasoline vapor, so that if the carburetor is properly set and additional gasoline vapor is drawn in to the manifold then the mixture will be too rich. On the other hand in order to have the proper mixture reach the cylinder the carburetor would apparently have to be set too lean when a device



of this sort is used. It seems to us like borrowing from Peter to pay Paul. That is, you take less gasoline out of the bottom of the tank and more of it out of the top, but the results would seem to be

the same if the carburetor is set accordingly. Perhaps the manufacturer will see this article and will be kind enough to present his argument in favor of the construction indicated.

## Wiring of Dual Ignition on Stutz

Q.—Advise if you could give information in regard to the Dual ignition system on a series S-710 Stutz car. Would also like to get information on the valve clearance on this particular engine as to the intake and exhaust valve. Would like to know the gear ratio, horsepower, bore and stroke. Also wish to know if there is an air pump on this model car that pumps air pressure into the gasoline tank in addition to the hand-oper-

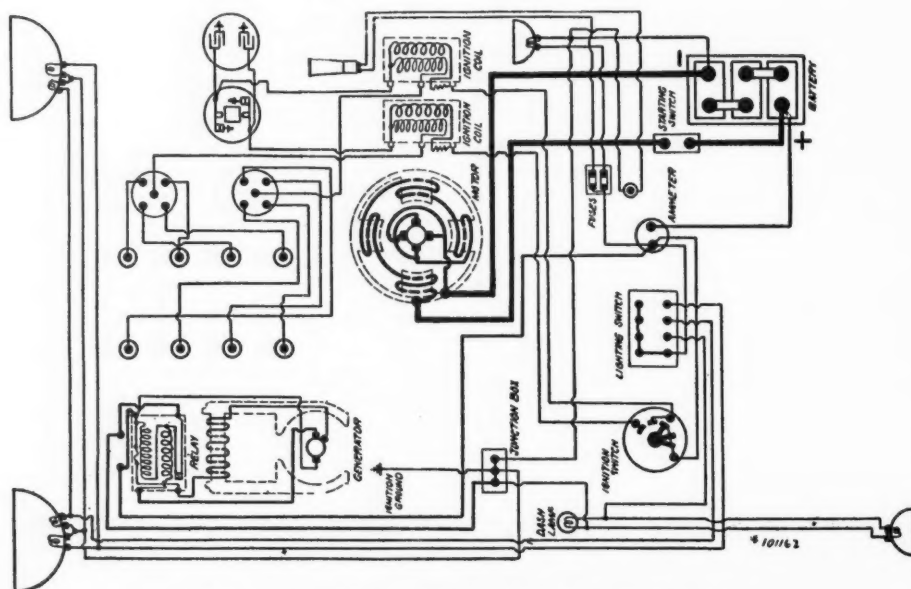
ated pump on the dash. Would like to know the speed rating of this car at the factory.—C. W. Lopp, Baldwin, Kan.

Two types of ignition systems were used on Stutz cars put out at about the time of the series S. One of these was a Remy magneto which was the typical high tension magneto, except that the ends of the secondary were both brought

out and two distributors were used. In this way the spark would first jump one spark plug and then would have to jump the other spark plug in the same cylinder in order to get back to the secondary winding again. The magneto would stop by the usual grounding switch.

The other Dual system was the Delco battery ignition, in which two coils and two interrupters were employed. We are accordingly showing a diagram of the Stutz car which used this battery ignition system for it shows clearly the ignition circuit. In one interrupter housing was a four-cornered cam operating two pairs of contacts, each pair of contacts working in connection with one of the coils. The condensers were in the other ignition casting while each ignition unit carried one of the distributors.

We have no definite information on valve clearance but assume it should be from .003 to .005 in. The gear ratio was 3.5 to 1, the horsepower was 30.6 and the bore and stroke were 4 3/8 in. and 6 in., respectively. The engine was equipped with a pump which served to supply air pressure to the gasoline tank after the engine was started. We have no figures on the speed of the car but assume it was in the neighborhood of from 55 to 65 m.p.h.



This diagram shows system used on Stutz car series S



## Cost of Supplying Electrical Power in Town of 600 People

Q. I am installing a light plant in a town of 600 population and wish to use a 6 K. W. D. C. generator and drive same with a Fordson tractor motor, equipped with a governor. Will this motor pull the load and at what speed would you recommend running the engine? What is the horsepower of this motor at the drive pulley? What is the fuel consumption under full load? Kindly give me your opinion as to the practicability of an installation of this sort. What would you recommend charging per K. W.?—Carl Anderka, Orange Grove, Texas.

### Question Easy from Mechanical Side

Your question is an easy one to answer from the mechanical and electrical side, but not so simple from the financial side. The engine suggested is very suitable for the purpose and there are at least two concerns which sell this engine already equipped with suitable stand, drive pulley and other attachments which make it convenient to use as a source of power. The names of these concerns will be given by separate letter. The engine should develop 22 horsepower maximum, but we would not recommend driving it so as to use this power continuously.

The 6 K. W. which you wish to generate is about the equivalent of 8 horsepower and figuring a generator efficiency of 80 per cent it means that 10 horsepower developed by the engine will do the work and as this is well within the power range of the engine we believe that the installation will be satisfactory. We would recommend running the engine at about 1,000 r.p.m., and your generator at the speed recommended on the name plate, which is probably 1,800 r.p.m.

This would mean that your pulley ratio would be as 10 is to 18, the large pulley being on the engine and the smaller one on the generator. For example if you had an 11-in. pulley on the generator you would need one about 20-in. in diameter on the engine. The fuel consumption of a well-designed engine is usually about .75 lbs. per brake horsepower hour.

### Cost of Fuel a Small Factor

We will assume that the consumption on this engine will be .8 lbs. per b.h.p.h. or 1.07 lbs. per k.w.h. Taking into consideration the efficiency factor of the generator this brings the amount of fuel up to 1.34 lbs. per k.w.h. delivered from the generator. Figuring 6.5 lbs. per gallon we then have .203 gallons per k.w.h. and with fuel figured at 20c per gallon we have 4c per k.w.h. as the cost of fuel and adding something to this for oil and other miscellaneous supplies we might say that the power will cost 5c per k.w.h. for fuel, oil and miscellaneous supplies.

We wish to point out, however, that the cost of fuel is only a small factor in the cost of furnishing this service in your town. If we figure that the average load will be due to the use of the ordinary 60 watt Tungsten lamps then we can light 100 of these lamps from the output of the machine. Then if we figure that the

average family will have four lights turned on at night it means that you can render service to 25 families each operating four lamps.

We will have to estimate the amount of time that the lamps are used and will say that on the average they are turned on from 7 o'clock in the evening until 10 o'clock or a matter of three hours. Then multiplying the 6 k.w.h. by three and then by 365 the number of days in the year, we have 6560 k.w.h. as the amount of power you will sell in a year.

The cost of fuel to develop this power we will get by multiplying by 5c, but you must also remember to add the cost of the engine per year. If we figure that the engine costs \$500 and that it can be used for four years, it will mean a cost of \$125 a year. Then you should figure the value of the floor space for your equipment which we will say is \$10.00 a month for 12 months.

### Charge Part of Time as Salary

You should also charge a part of your time to the venture as salary for either you or someone else will have to take care of the plant part of the time. We will say that the value of this service is \$1,600 a year and that one-fourth time is required so that the cost is \$400. If you will put in measured service you will have to get meters and while we have not taken the time to find out the actual cost of meters we assume that they will be about \$30 each and 25 would be needed which would mean \$750 for meters and spreading this over a five-year period would mean \$150 a year. The cost of wiring up to the various houses you will also have to determine and figuring this at \$40.00 a house multiplied by 25 houses gives us \$1,000 which divided over a five-year period means \$200 a year. Tabulating these expenses we have the following:

### COST OF OPERATING POWER PLANT IN SMALL TOWN

Furnishing 6560 k.w.h. at 5c (fuel).....	\$328
Engine \$500 for 4 years, 1 year.....	125
Rent, floor space, \$10 per mo., 12 mos	120
Salary, \$1600 per year, 1 quarter year	400
Meters, 25 at \$30, \$750 for 5 years, for 1 year.....	150
Wiring 25 houses at \$40, \$1000 for 5 years, 1 year.....	200
	<hr/>
	\$1323
10 per cent profit.....	132
	<hr/>
	\$1455

The cost then of furnishing this power for a period of one year will be \$1455 and dividing this by the number of k.w.h. gives us 22.2c per k.w.h. which would be what you would have to charge on this

basis. Figuring the cost to each family for a month we divide \$1455 by 25 which is the number of families and also by 12 to find that it will cost each family \$4.85 per month. You will note that these figures are somewhat high and it is possible that on investigation you will find that the cost of wiring or meters or some of the other items will be less than we have figured. We hope that this is the case, but we also hope that you will not forget these items, for, as you can see, they amount up to more than the cost of the fuel does.

### Will Give Better Service

For an installation of this sort we believe that you cannot only make more money, but also give a great deal better service by having a storage battery system in which the battery is used to supply current in small amounts in the day time and in the early morning hours for example, from midnight until morning. It also means that you can have your engine running in the day time to charge up the battery and then can use the battery to furnish overload current at night so that instead of taking care of 25 families you can take care of 50 families. Figuring the cost on the basis of purchasing a battery, which we will say costs \$1,000 and will last for five years we would have the following figures, in which the fuel, meters and wiring cost twice as much as before, but the cost per k.w.h. has come down.

### COST OF OPERATING BATTERY EQUIPPED POWER STATION IN SMALL TOWN

Fuel .....	\$656
Engine .....	125
Rent .....	120
Salary .....	400
Meters .....	300
Wiring .....	400
	<hr/>
	\$2001
Profit .....	200
	<hr/>
	\$2201

The cost per k.w.h. will then be \$2200 divided by 13120, or 16.8c per k.w.h. The 13,120 is the number of k.w.h. you can supply when you have the battery as the reserved source of supply and is twice the power than could be sold otherwise. The cost per family will then be 2200 divided by 50 and also divided by 12, or about \$3.66 per month on the average. The sale of power for day time use where flat irons and toasters are used will add additional profit which we have not shown, but it is somewhat hard to figure on it definitely.

## Correction of Oil Leakage and Oil Pumping

Q.—Can you give me a remedy for trouble I am having with an Oldsmobile model 45A car No. 137962, motor No. 102793 which uses an excessive amount of cylinder oil. This car uses a quart of oil every 25 miles, and never has a fouled spark plug. The oil leaks out of the rear and front ends of the crankcase around the crankshaft. I had thought some of cutting an extra oil groove in the rear main bearings and draining oil through a hole in the bearing cap just ahead of the lower rear bearing bolt, also another hole through from the timing gear case into the main crankcase so the oil level would be lower in the timing gear case. Would this eliminate the trouble?—Harry Brennan, 207 West Linn street, Marshalltown, Iowa.

### Correction of High Oil Consumption with Lynite Pistons on Model 45-B Eight Cylinder Car

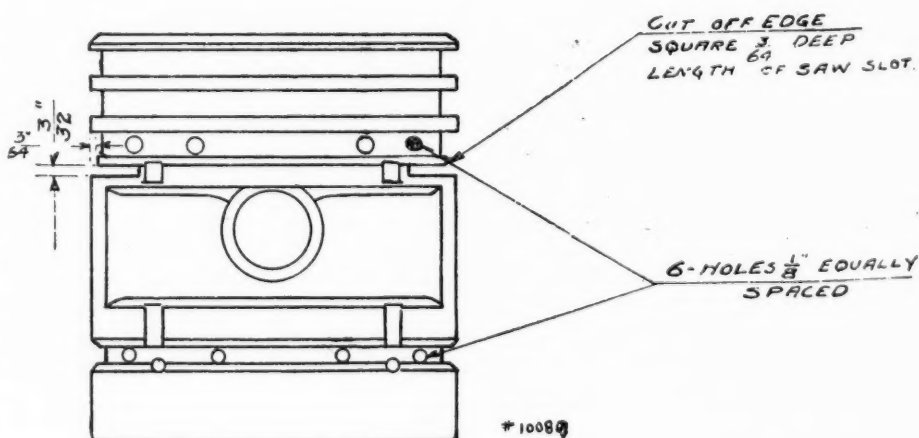
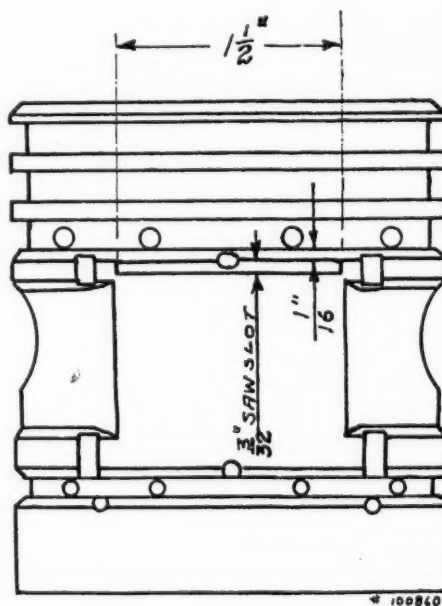
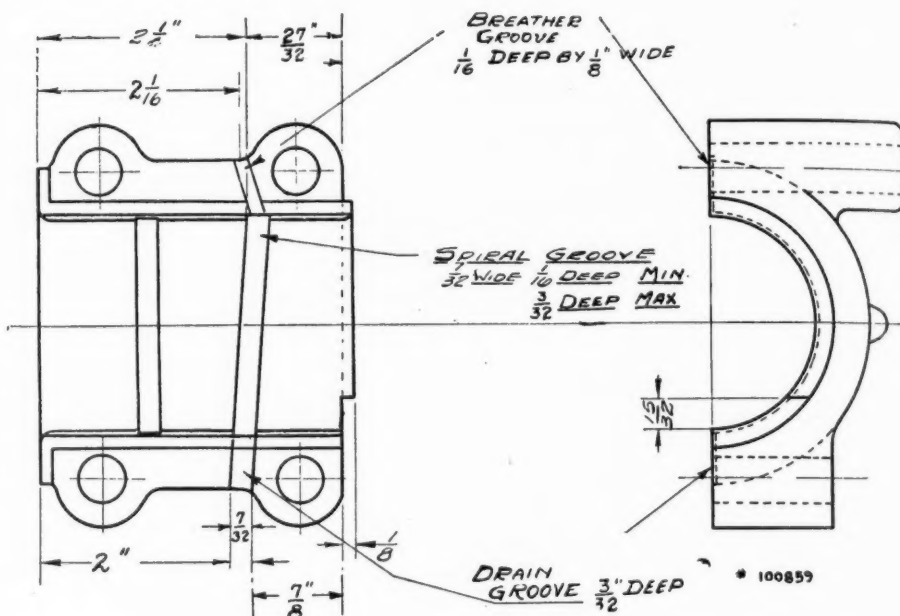
While you state that you are apparently having no trouble with the oil getting up past the piston, we are, nevertheless, giving instructions for eliminating such trouble, should it occur, also for eliminating the leakage past the bearings. See that all valves are seating properly, for poor condition of the valves will tend to make the engine pump oil. Check the ignition timing and see that the engine is hitting on all cylinders. Check up both main and connecting rod bearings to see that they have the proper clearance. Remove the rear main bearing cap assembly and groove as shown in the illustration. Replace and adjust both front and rear main bearings to specifications. Saw and drill piston as shown in the illustrations, installing three special American hammered rings in the top grooves. Take up blade rods by removing shims to standard limit of clearance. Install oil pan spacer No. 383,120 when replacing pan.

### Correction of High Oil Consumption with Lynite Pistons on Model 37-A Six Cylinder Car

See that all valves are seating properly. Check ignition timing and see that engine is hitting up on all cylinders. Saw  $3/32$  in. slots in the thrust side of piston  $1/16$  of an in. below the third ring groove and relieve skirt  $3/64$  of an in. below its diameter and between lower edge of third ring groove and top of saw slot for the length of the slot. Drill six  $1/8$  in. holes straight through piston in the bottom of third and fourth ring groove, staggering with those already in the piston.

Install special American Hammered oil rings in second, third and fourth ring grooves, using plain American Hammered rings in top groove. With cast iron pistons drill six  $1/8$  in. holes straight through bottom of the third ring groove and at the lower side of groove staggering them with the holes already in the piston.

Install one special American Hammered oil ring in the third ring groove, using two plain American Hammered rings in the top grooves, with pistons fitted to standard limits of clearance.

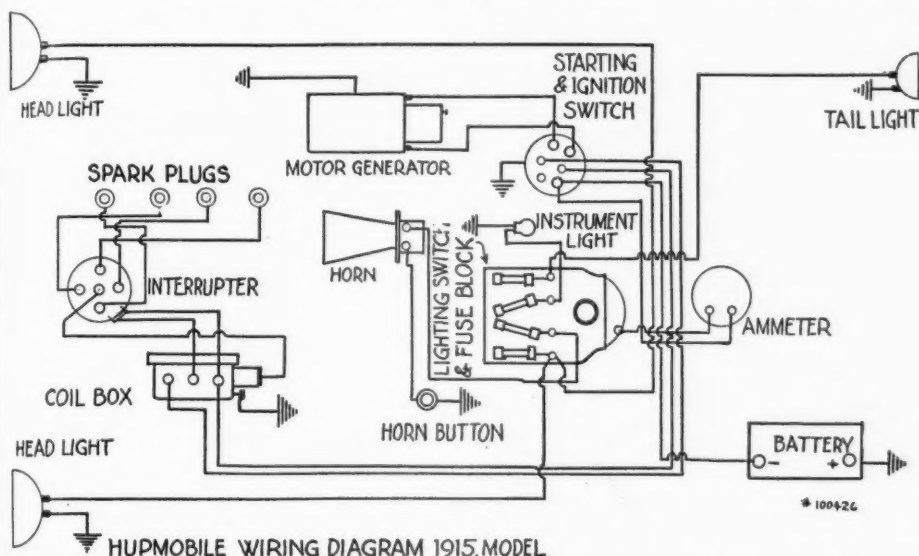


With excessive clearance two special oil rings to be used in the second and third ring groove with one plain ring on top

with reasonable degree of success. Limit of piston clearance in excess of .005 not recommended.



# 1915 Hupmobile Wiring Diagram



Q.—We have a 1915 model K Hupmobile and would appreciate a little information. This car has been driven 33,000 miles. The compression seems to be good, the valves and ignition timing check O. K., the water circulation is good, but it continues to heat spark plugs and we do not seem to be able to find the cause. What is the supposed speed of this model? We cannot get more than 30 miles per hour out of it. It is equipped with a Zenith

carburetor N-H-50, but we do not seem to be able to adjust it right to pull the motor. Would you suggest any other carburetor and if so what kind? Send wiring diagram for this model Hupmobile.—I. M. Moore, East Bernstadt, Ky.

If you have the original Atwater Kent open circuit type ignition we believe that you will find the trouble at this

point. With this system there was a natural lag in the spark so that at high speed the spark was usually not advanced enough. An automatic advance mechanism was built in the unit but it was not always sufficient to suit the needs of the engine.

We would suggest your replacing this with a closed circuit type of battery ignition system of any reliable make. This should be set so that the spark occurs when the piston is on upper dead center with levers in the retard position and on this car you may have to install a spark advance lever mechanism of some sort as there was none on the car as originally built. We would suggest your testing the spark plugs to see that there is no leakage around the insulators as this will cause them to get hot.

It is also likely, however, that the heating is due to spark not being advanced enough at high speed and also due to the fact that this is a high compression engine. We would recommend your using some good airplane type of spark plug having short electrodes which extend only a slight distance out of the insulator.

You should get at least 50 m.p.h. from this car.

## Testing Magneto Magnets

Q.—You have been recommended to me as being expert authorities on electrical problems and if it would not be asking too much I would deem it a great favor if you would answer the following: 1. What is the best way to determine the strength of permanent magneto magnets?

A method commonly used is to have a spring balance which is capable of registering 25 lbs. or over. Also have a piece of soft iron about  $\frac{1}{4}$  in. by  $1\frac{1}{2}$  in. by 6 in. to use as a keeper. When you have magnetized the magnet by means of a magnetizer, put the keeper on the end before removing the magnet from the magnetizer. Then use a piece of wire or strong cord to attach the center of the keeper to the spring balance and pull the magnet slowly and carefully to see at what point the keeper is pulled away from the magneto.

The ordinary magneto magnet when properly magnetized will pull the spring balance up to about 25 lbs. before the keeper lets go. The ordinary magnetizer is used by connecting it to a battery and the magnet should be placed on the magnetizer and pulled off so that the ends of the magnet come off last. This action should be repeated with the magnet continually dropped on the magnetizer and pulled off with the ends coming off last, the last time of course with the keeper being applied just as the ends are withdrawn.

Q.—Is there an instrument for testing magneto magnets, and if so where can it be obtained and what would it cost?

There is a very fine instrument on the market for this purpose, the cost being approximately \$25. Name of concern will be given by letter.

Q.—Where can I obtain a small lathe, especially designed for electrical work, and what would it cost?

This information will be given by letter.

Q.—If a starting motor consumes 200 amperes for three seconds in cranking an engine, which starts at the end of that period, and the generator then charges the battery at a 6-ampere rate, how long will it take to put back the current that has been taken from the battery from starting.—F. M. Yearsley, Hockessin, Del.

The energy consumed depends not only on the current but on the time and may be obtained by multiplying the two together. For this reason the 200 amperes for 3 seconds is the equivalent of 600 ampere seconds and as there are 60 seconds per minute it will be the same as 10 ampere minutes.

If we have the 6-ampere current flowing for  $1\frac{2}{3}$  minutes, we would put back energy equivalent to 6 times the  $1\frac{2}{3}$ , or 10 ampere minutes, and would apparently restore the battery to its original condition of charge. However, a battery, like other mechanical and electrical devices, is not 100 per cent efficient, which means that we have to put back more current than we took out. Then if we assume that the battery is 80 per cent efficient instead of sending a 6-ampere current in for  $1\frac{2}{3}$  minutes we would have to allow the current to flow for a little over two minutes to restore the starting current taken out in three seconds.

## Owen Lighting Plant Description

Q.—I have an Owen electric light plant with which I am having trouble to get the valve set and keep it set after I get it to run. I also have to hold the cutout switch closed when it is running or it will not charge. Tell me where I can get a wiring diagram of this plant also where I can get a cut of the engine.—Edinburg Garage, Ravenna, O.

A rather thorough description of this lighting plant was published in the September 28, 1922, issue of Motor Age, and as we happen to have spare pages from this issue we are mailing them to you by separate letter. This describes the valve action, shows the engine construction and also gives a wiring diagram. We do not see how the valve setting can change very well unless one of the gears is loose on the shaft. We believe, however, that a study of this article and inspection of the engine will clear up this part of the trouble.

Referring to the diagram you will see that current from the positive generator goes through a fine winding in the cutout and as the cutout does not close it is probable that this fine winding is broken. After studying the article being sent to you, we would be glad to hear from you again if you do not absolutely overcome the difficulty.

# BOOSTING ACCESSORY SALES

"AND, with my new car sales rather slow, I found that there were two or three things that I had to do in order to keep ahead," said a dealer friend the other day who was explaining to us how things were going. "In accessories I found a department that I had heretofore thought little of. I carried some accessories, but never went after it very strong until I had to. I was surprised at the money I took in when I put in a real accessory department."

You, too, will be surprised if you have been one of the fellows who hasn't thought much of an accessory department—try it, concentrate on it for a while and after a bit, it will take care of itself.

## Wash-Rite Auto Mop

Wash-Rite Auto Mop Co., St. Louis, Mo., is the manufacturer of the Wash-Rite Auto Mop which screws on to any standard hose. The patented feature of its construction is a baffle plate against which the water strikes and which throws the water to the outer edges of the mop. This mop is made in two grades, one listed at \$1.50 and the other at 90 cents.

## No Battery with This Light

The portable flash light has been for a long time recognized as a useful device around an automobile, but the weakness of the conventional flash light is the battery which is frequently discharged or at least partially so when the light is needed. To overcome this feature of the flash light there has been placed on the market by the Chidsey Company, 110 E. 13th Street, New York City, a portable flash light which has no battery.

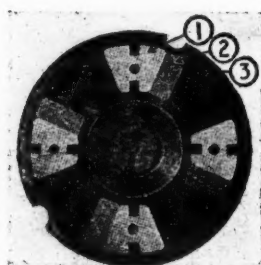
Instead it contains a small electric generator which is driven by means of a small lever attached to the flash light. The light is produced by grasping the device with the hand and operating the lever with three fingers. The more rapidly the lever is operated the brighter the light will be. The list price of this flash light is \$5.00.

## Holds the Garage Door Open

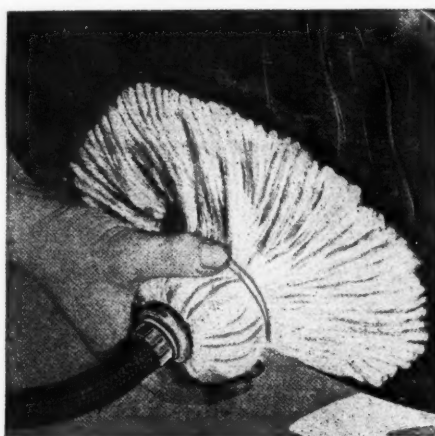
Sta-Open garage door holders are made by the Blakely Mfg. Co., Fullerton avenue and Monnier road, Detroit. They are made of steel, black japanned and a screw driver is all that is needed to apply them. Each set is put up in a box with screws and directions for attaching. They are packed and shipped in dozen lots only and the retail price is 50 cents a set. When not in use the holder drops into a pocket; when opening the door the holder is taken out of the pocket and dropped to the ground.

## U. S. Tire Gage

A tire gage that will indicate the exact air pressure has been announced by the United States Gauge Co., 44 Beaver street, New York, N. Y.



Device to withstand timer flash



Wash-Rite auto mop

The construction of this new tire pressure gage is based on the Bourdon spring principle. It is of non-corrosive materials throughout, contains no rubber to deteriorate and no intricate mechanism to get out of order. The gage is rugged, durable and dependable and is fitted with an unbreakable crystal.

The U. S. Tire Gage is made in one standard model so designed that it renders the valve stem easily accessible, whether the wheel be wood artillery, wire or disc. Gages are made calibrated to 80 pounds pressure for standard tires and to 60 pounds pressure for balloon tires. Complete with leather case, the U. S. Tire Gage retails for \$1.50.

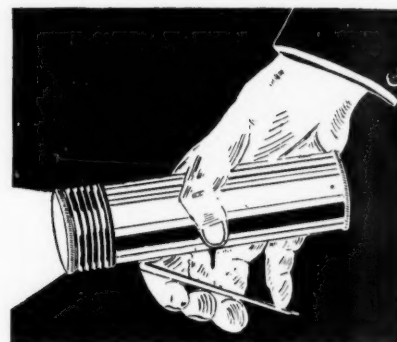
## Device to Withstand Timer Flash

A development, on a sliding contact timer for Ford motors is announced by the Turner Manufacturing Company of Kokomo, Indiana, builders of the Turner 2 in 1 Timer. It is designed to withstand the "flash" that occurs at the break of contact between the timer insert and brush, and which prevents the charring and pitting of the disc at this point.

This is the introduction of an insert of laminated insulating material abutting with the circuit-breaking side of each brass contact in the timing disk. This insert is for one purpose and at one point only, the only point at which it is needed. The pieces of laminated material moulded in at this point serve to absorb and withstand the flash. The genuine Bakelite used for the body of the



Dunlop clipper



Chidsey flashlight

disc is retained excepting at the points abutting with the circuit break side of the contacts. It is said that the laminated insulating material and the Bakelite have the same wearing qualities, which assure even wear of the disk surface. The arrow pointing to "No. 2" indicates the laminated material in the illustration above.

The arrow "No. 1" indicates the brass contacts of special keystone shape. These are stamped from very hard yellow brass. Their shape assures full contact being made and broken instantly between the full widths of the edges of the timing brush and the insert. "No. 3" is the genuine Bakelite used in the body of the discs on all Turner Timers.

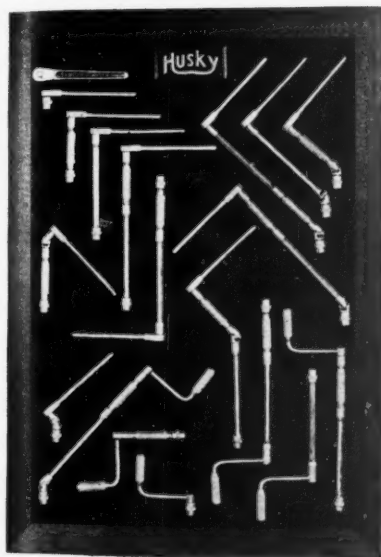
## Dunlop Clipper

A normal size clincher, to be known as the Dunlop Clipper, has been added to the line of the Dunlop Tire & Rubber Co., Buffalo, N. Y. While it has only recently been offered to the trade by the American works, it has been in use in other parts of the world, having been featured for a number of years in England, Canada, Australia, South Africa and the several other works of the company.

The tire, in appearance, is similar to the manufacturer's standard pneumatic and balloons, save that the tread blocks are of a slightly different design.



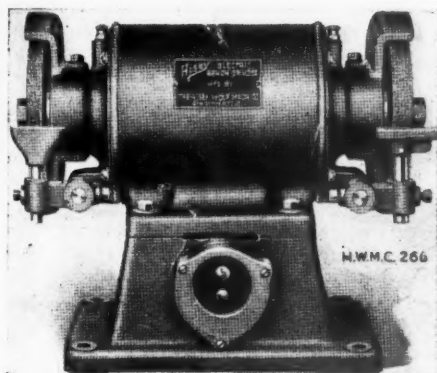
# GETTING MORE OUT of the SHOP



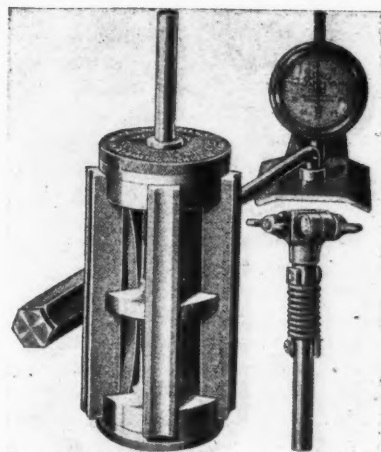
Husky wrenches for the shop



Ferry No-Soun shackle bolt nut



Hisey bench grinder



Colonial cylinder hones

NEW car sales have not been as good as some thought they would be this year, due to the weather or anything that you care to assign to it, but there are certain dealers who are not worried and there are others who are very much of the opposite frame of mind. The dealer who has been operating a shop that not only does work but gets paid for it and shows a profit, is one of the ones who is not worrying.

The shop should be (and if you care to put a little effort into it, you can make it), a department that will always show a profit. It can even be made to carry you over a tough winter if you are prepared to do the work which will be demanded of you. Right now, of course, the winter is pretty far off, but not too far off to think of getting ready for it.

Check over the items that appear on this page every week and see if any will fit profitably into your program. You can be sure that with the right equipment and

a little salesmanship, you can put your shop over strong.

## Hisey Bench Grinder

A new midget type six-inch wheel bench grinder, equipped with a thermostatic safety motor switch, is offered by the Hisey-Wolf Machine Co., Cincinnati, O. This grinder can also be supplied with Hisey Full Safety Combination Wheel Guards. Ball bearings are used throughout. All bearings are completely enclosed from dust and grit and provided with heavy felt protector washers on each side of the bearing housing.

## Ferry No-Soun Shackle Bolt Nut

The Ferry No-Soun Shackle Bolt Nut, is a device to eliminate squeaks and rattles from loose shackle bolts and do away with the necessity for "taking up" and tightening these bolts.

It is quickly and easily applied at the end of the springs, where the shackle

is assembled. There are but four parts, all well designed and rigidly constructed of steel. "A" and "C" are cups, telescoping into each other. "B" is a heavy coiled spring. "D" is a blind hexagonal nut.

Before applying, the cups are filled with heavy grease. By screwing up the nut on the shackle bolt to the desired amount, a tension is placed on the spring. This completes the installation, and no further attention is necessary. The tension of the spring prevents the nut on the shackle bolt to the desired slack in the shackle assembly. The grease packing keeps the whole device noiseless. The outer surfaces of both cups and nut are heavily nickled. The manufacturer is The Ferry Cap & Set Screw Co., Cleveland, O.

## Colonial Cylinder Hones

These are made by Colonial Gear & Manufacturing Co., Kalamazoo, Mich. They are self-centering and self-aligning. The company manufactures different individual hone sets for bores  $2\frac{3}{4}$  to  $3\frac{1}{8}$ ,  $3\frac{1}{4}$  to  $3\frac{5}{8}$  and  $3\frac{3}{4}$  to  $4\frac{1}{4}$ , the price of which is \$17.50. This concern also offers the Colonial-Ames cylinder gage for repair men showing straightness, roundness, size and scored cylinders to prove to a car owner that his cylinders need regrinding. The price of the gage is \$17.50. Set No. 123, capacity  $2\frac{3}{4}$  to  $4\frac{1}{4}$  in. bores, is priced at \$47.50, with the gage extra.

## Husky Wrenches for the Shop

These are the product of the Husky Wrench Co., Milwaukee, Wis., and are not only interchangeable socket wrenches, but combination wrenches as well, with an interchangeability of sockets and handles all the way through. Features of this line are the handy grip which can be placed just where the mechanic needs it. The crank handle can be used in connection with the handy grip to facilitate operation and is of value in connection with overhead work or in lying under the car.

These wrenches are heat treated, rust proof, nickel plated with a semi-polish finish.

The sockets are designed individually to suit the best S. A. E. and U. S. screw standard. The sockets are not of equal length and each is designed with oversize hex, and chamfered to fit the bolt easily. Every socket has a tapered front end to get into small places.

A  $\frac{9}{16}$  in. hex handle hole has been adopted. The sockets are machined from specially selected steel. This company features its universal joint, long extension bar, speed crank, combination tee, flat ratchet and square adapter.

## Time Payment Sales Enlarge Dealer's Field

(Continued from page 21)

tion is given to the finance company, the dealer then becomes in effect merely an order-taker, and the banking institution becomes the merchant and determines the market.

The selection of the credit risks by the finance company will be in accordance with arbitrary rules with a tendency toward uniform application in all territories with all dealers, without the advantage of the intimate knowledge as to local conditions and prospects enjoyed by the individual dealer concentrating on a small territory. A broad extension of this principle would be serious in its effect upon the efforts of the industry in building up a strong independent distributing organization in the field. It will prevent the dealer from acquiring experience in credits and collections and developing his initiative and efficiency. It also removes from the dealer the necessity of exercising caution in expanding his market.

### Why Dealer Should Participate

The ideal situation is to give every dealer the utmost latitude in capitalizing his ability and efficiency as a merchant and a business man. For example, an efficient dealer in control of all the functions of his business will sell more cars, supply his market to a greater extent, suffer less credit losses and make more profit than an inefficient dealer similarly situated. It is the efficient dealer that the motor industry should encourage and perpetuate. This chance for greater profit for the dealer is emphasized when we realize certain other factors which exist in non-recourse financing. The finance company which takes the entire merchandising risk must provide for credit reserves and operating expense in an amount larger than would be necessary in case the individual dealer carried his own risks. This excess charge results from the abnormal collection expense in handling delinquent items and also from the lack of facilities for disposing of repossessed cars. No finance company can repossess, warehouse, recondition and resell cars of delinquent debtors as economically as an extended dealer organization especially designed and equipped for servicing and merchandising cars. The cost of this inefficiency must be provided for. It is paid by the purchaser through an increased time price, and sales resistance to that extent is unnecessarily increased. In this connection also it must be remembered that the non-recourse finance company must dispose of these repossessed cars in the used car market in competition with the dealer organization and, since the finance company's problem is chiefly a salvaging proposition—to recover only the unpaid balance of the purchase price—the possibilities for disorganization in the used car market in a given territory are tremendous.

The object of the motor industry should be to develop, in all territories, dealers who will be complete merchants. The dealer should jealously retain control of every function of his business. This includes the control of the selection of credit risks and the making of collections and the extent to which the market can be developed in his territory. Out of the gross profits on his sales, provision should be made for all expenses of operation, fixed charges and credit reserves. If the gross profit at the present time is too much or too little, it should be adjusted in accordance with legitimate marketing conditions as they exist today. The dealer should concentrate on installing efficient methods in every department of his business, so that to his customer after a reasonable return on his capital has been made.

The local bank and the finance company should join in a program to help the dealer to become a better merchant in his

community. They should aid and advise him on his credit and collection problem, so that he can develop to the point where his chief reliance on his banking connections will be for financial accommodation.

The function of the bank or finance company in checking retail credits and making collections for the dealer should be supplementary to his own efforts, and the dealer's line of accommodation with the banking institution should be largely influenced by the dealer's efficiency and soundness as a merchant and his spirit of co-operation with his banking connection.

Some mention should be made of the charges for discounting retail receivables. This is an important consideration, as the amount of these charges has a direct bearing on the purchase price of the car. Ordinarily the average merchant in other lines usually quotes the same price to his credit purchaser as to his cash purchaser, frequently with a discount for cash. All expenses and deductions incident to credit merchandising are deducted from his gross income. The motor industry originally was concerned with a cash market only and the original sales methods of the industry were based on this premise. These conditions still exist. The dealer has, therefore, been permitted to fix his own time price. This time price consists of the cash price plus a financing charge. This financing charge is usually measured by the rate charged in discounting the receivable, although many dealers add a further charge which is reserved by them as additional income.

The dealer should endeavor to sell the car to his time purchaser at the lowest possible price consistent with a reasonable return on his capital. All charges should be reduced to the minimum amount necessary to offset the expense involved. He should not attempt to make a profit out of his financing operation nor should he permit unreasonable charges by banks or finance companies.

For the five years ending December 31, 1923, we have transacted a total business of \$556,000,000, divided as follows: Wholesale, \$229,000,000; retail, \$272,000,000, and foreign, \$55,000,000. In the year 1923, the volume of business was: Wholesale, \$95,151,350; retail, \$102,049,475, and foreign, \$21,415,288, or a total of \$218,616,113.

### Losses Under 1/5 of 1 Per Cent

Since inception to date, the credit losses have been appreciably under one-fifth of 1 per cent of total volume to date. Our credit loss experience on the retail business handled in the year 1922 is practically completed and the year 1923 is only partially completed. The credit losses on all retail business on new and used cars and trucks for the year 1922 will not exceed fifteen one-hundredths (15/100ths) of 1 per cent of the retail volume for last year. The loss ratio for the year 1922 on the new passenger car monthly installment business will not exceed seven one-hundredths (7/100ths) of 1 per cent of the volume.

On January 1, 1924, there were total motor vehicle receivables on the books of the company of \$72,509,000. From January 1 to April 1 this year \$74,486,000 of business was transacted. On April 7, there were total motor vehicle receivables on the books of \$91,222,000, showing that \$55,773,000 had been liquidated during that period. Of the total of such receivables on April 1, \$40,197,000 represented balances on retail motor vehicle transactions. Of this amount, only \$135,989, or thirty-three one-hundredths (33/100ths) of 1 per cent was over thirty days in default. Of this amount, only \$44,876, or eleven one-hundredths (11/100ths) of 1 per cent of the total retail receivables, was over sixty days in default. Delinquent items on repossessed cars are included in these figures.

The experience of this company since inception covers retail sales of approximately five hundred thousand cars to individual purchasers in all walks of life, in every section of the United States of America, Canada and the British Isles. There are on the books today approximately two hundred thousand purchasers who are paying for their cars on a time basis. Five years of operation has convinced us that the selling of cars on a time basis is a satisfactory experience for the purchaser, the dealer, the manufacturer and the banker.

~~~~~  
*No automobile distributor or dealer can class himself as a real merchant until he has equipped himself to handle credit sales, as this normally represents his largest potential market. The wide-awake dealer will prepare himself now and thus prevent the absorption of his market by his competitor.—  
 From Mr. Cooper's address.*  
 ~~~~~



# SQUEEKS & RATTLES

THERE are lots of baseball pitchers who have speed but who never get farther than a sand lot team. They have just the one asset, speed.

And, there are lots of cars afflicted the same way, except that they are not confined to sand lots. Anyway, it's not the car's fault, any more than it is the pitcher's.

The success which a pitcher enjoys on the diamond is calculated not by how much speed he has but how much control.

Control is largely a matter of brains. Any boob can throw a ball fast but it takes a brainy man to control it.

So with the car—any boob can drive one fast (and most of them do)—but it takes brains and a clear head to hold the wheel.

It would seem that there are few brainy people in the country, because no sooner does some guy think the copper isn't looking and steps on it, than he tries to pile the whole works through a knothole in some barn.

Speed is one thing, being swift is another. Did you ever see it to fail where the bird that goes along, takes his time, plays safe and never gets past the limit, didn't get home long before the dude who wants to do the work of a steam roller in about one-sixtieth of the time?

We have often wondered what the expression on a speeder's face would be if we could see him in one of those "slow motion" films.

Lots of doctors would order him put away as insane, if they could see.

Speeding and the accidents that result are holding up sales of automobiles to people who make the best owners. Dealers can do a whole lot if they will take a hand and help to discourage the mental misfits who delight in terrorizing everybody who happens to have to look at them.

## Corrected

"Niggah, I'se goin' to mash yo' nose all ova yo' face; I'se goin' to push dose teeth down yo' throat and black both yo' eyes—et cetera."

"Black man, you don't mean et cetera, you means vice versa."—*Notre Dame Juggler*.

## A Bad Habit

Magistrate—"And what was the prisoner doing?"  
Constable—"E were 'avin a very 'eated argument with a cabdriver, yer worship."

Magistrate—"But that doesn't prove he was drunk."  
Constable—"Ah! But there weren't no cabdriver there, yer worship!"—*Tappet*.

*Eventually there will have to be a field hospital for pedestrians.*—*Tappet*.

## No Argument

"No, Herbert, I am sorry; but I am sure we could not be happy together. You know I always want my own way in everything."

"But my dear girl, you could go on wanting it after we were married."—*Boston Globe*.

*The song the reformers sing seems to be made up wholly of refrains.*—*Washington Post*.

## The Reveler

The following is not without subtlety: A man came home to the wife of his bosom in the wee sma' hours and proceeded to disrobe.

"John," said his wife, "you haven't got your undervest on. You were wearing it when you left this morning, I'm perfectly sure."

Her spouse glanced down for a moment, puzzled and guilty. Then, like a flash, came the inspiration.

"Good God," he said, "I've been robbed!"—*London Mail*.

## Fear Not

"I'm sorry," said the lawyer apologetically, "but I'm afraid there'll be a good deal of publicity connected with your divorce."

"Huh!" was the grim retort of the celebrated actress. "There'd better be."—*Hoosier Motorist*.

## The Big Gamble

Preacher (solemnly)—"Rastus, do you take dis here woman for better or for worse?"

Rastus (from force of habit)—"Pahson, Ah shoots it all."—*Bison*.

## Going Bye-Bye

"The officer is all wrong, your honor. I wasn't doing anything like sixty miles an hour."

"Were you watching your speedometer?"

"No sir. I didn't need to. I wasn't in any hurry—I was just out for a spin. I wasn't going anywhere."

"Well, you're going somewhere now. Ten days."—*Huntington Motorist*.

*Some people's records would not sound well on their phonographs.*—*Life*.

## No Trade

Farmer—"Be this the Woman's Exchange?"

Woman—"Yes."

Farmer—"Be ye the woman?"

Woman—"Yes."

Farmer—"Well, then, I think I'll keep Maggie."—*The Vancouver Daily Province*.

*Three things never perform satisfactorily when there is company present—the kids, radios and automobiles.*—*Lancaster Motorist*.

## Present Price Cut Less Severe on Makers Than Last Year's

**Reductions Plus Good Weather  
Probably Will Shrink Stocks to  
Normal Volume**

AKRON, O., June 23.—The cut in automobile tire prices which was inaugurated by the Fisk Rubber Co. and has been followed by the entire industry, ranging from 2½ to 20 per cent, depending upon sizes and kind, will affect the rubber industry less severely than did the cut in prices which marked the middle of the past year.

When tire prices were slashed in June of 1923 the industry realized that the second half of the year would probably be without profits and the actual statements issued at the end of the year showed these predictions to be correct. At that time it was impossible for the industry to absorb a 15 to 20 per cent reduction without suffering losses.

Conditions in the automobile tire industry are radically different this year than they were only a short twelve months ago. The reduction, coupled with the sudden turn of the weather, will probably reduce the existing stocks during the remainder of the motoring season to more normal proportions, according to the industrial leaders.

### SELL ST. LOUIS BUS CO.

CHICAGO, June 23.—Chicago interests identified with the Yellow Cab and Chicago Motor Coach Co. have sold the St. Louis Motor Bus Co. to the United Railways Co. of St. Louis, according to a statement issued here by John Ritchie, president of the Chicago Motor Coach Co. The sale price was \$2,400,000, including physical assets of about \$1,000,000, money in treasury aggregating \$900,000 and good-will of \$500,000. The purchasers intend to develop the bus service as a supplement to regular street car service.

The St. Louis Motor Bus Co., successor to the Peoples' Motor Bus Co., was acquired by Chicago investors, headed by John Hertz, president of the Yellow Cab companies and chairman of the board of the Chicago Motor Coach Co., last November, who largely rehabilitated the bus service and developed it from 20 buses to 74 of the double-deck type.

### WINS STUTZ CONTEST

CHICAGO, June 23.—For the second time a Chicago salesman has won the Stutz annual sweepstakes contest, the honor this time going to Frank Prindle, of the Royal Sales & Service, 339 East 55th street, associate dealers of the Stutz Chicago Co., 2247 Michigan avenue. Last year L. C. Casey of the Stutz Chicago Co. won the prize.

## 91.5 Maximum Piston Displacement Will Be Rule of Indianapolis Speedway Race in 1926 Engine Size Has Been Reduced Four Times Since 1911 When 600 Cubic Inches, or Less, Was Required Under Regulations

INDIANAPOLIS, June 23.—With the almost certain 100 miles an hour average for the winner of the 13th annual 500-mile International Sweepstakes next May 30, James A. Allison, president of the Indianapolis Motor Speedway Company announces that for the fourteenth race in 1926, the piston displacement maximum will be 91½ cubic inches. This is in line with the policy of the Indianapolis Motor Speedway Company, the maximum engine size having been reduced four times since the initial race in 1911. All of the details and specifications for the race have not been worked out, but the announcement is made almost two years in advance that the engineers may have an opportunity to perfect the small engine.

The minimum weight for the 1926 race, for the car, without driver, oil, water or gas, is to be 1,200 pounds, the same stipulation as is in the entry blank for 1925 for cars with engines of this size.

The history of the 500-mile race, from an engineering standpoint is reflected in the stock car which the owner drives in the conduct of his business and in the pursuit of recreation. Back in 1911, when the 500-mile race was born, the engines were almost "square," which is to say that the bore was almost the same as the stroke. The 1911 and 1912 races were for engines of 600 cubic inches or less, which developed less power and speed than the engines of 1923 and 1924, consumed many times the gasoline and lubricating oil and were bulky and heavy pieces of machinery. In the year 1913 the displacement was reduced 25 per cent to 450 cubic inches or less, which maintained until 1915, when it was reduced one-third, to a maximum of 300 cubic inches, which was not reduced until after the war. In 1920, 1921 and 1922 the maximum was 183 cubic inches and in 1923 was reduced to the present 122 cubic inches.

### Gain of Speed

It is interesting even to the sportsman to follow the speed curve of the Indianapolis race with the knowledge that the engines were being reduced in size, but that the engineers were able also to so perfect the internal combustion engine that it gained speed rather than lost it in the process. The first race was won at an average of 74.59, but in 1912 the mark went to 78.7, which remained the record for 600-inch cars. The first year of the 450 the average was 76.92, but in 1914 the second year it shot up to 82.47. In 1915 DePalma set the record for the

300-inch class in its maiden year and it stood through two years of the next class. DePalma's mark was 89.84, in 1916 the average was 83.26; in 1919 only 88.06; in 1920 it was 88.50; in 1921 89.52. Milton's 1921 victory was the second year for the 183-inch class and it looked like DePalma's 300-inch record would stand, but in 1923, the last 183-inch year, Murphy shoved the record to 94.48. The first year of the 122-inch class Milton surprised the fans by reeling off 90.95, a speed in excess of all predictions, and a few weeks ago Joe Boyer, at the wheel of a Duesenberg, in the role of relief pilot out-guessed engineers, railbirds, and all the motorwise clan by putting the record at 98.23, with an engine one-fifth the size of those which could not attain 75 miles an hour thirteen years ago.

Harry Miller, the Los Angeles engineer who built the engine that carried Murphy to a record in 1922, in discussing engine sizes previous to the last race, hazarded the prediction that when the 91½ class was put into the field that before it was two years old it would have surpassed the record of the 122 class. This would mean in an eight-cylinder engine that the bore would be approximately two inches and the stroke three inches. These engines would have a piston content equal to a powerful motorcycle engine of the four-cylinder type. The cylinder content of the racers will be approximately one-half that of a Ford car's power plant and slightly more than half of an Overland four engine.

### Fuel Economy

The public gains in the development of the smaller engines through the economy in fuel, without loss of power, by speeding up the crankshaft to get more explosions per minute. It has also brought about the development of more adequate lubrication systems, the use of stronger metals, through the employment of alloys, due to the lightening up of all the reciprocating parts of the engine. It is also reflected in the smooth lines of the stock motor car, the strengthening and refining of the chasses of cars in all classes. Europe has many brands of motor cars with small engines of this type in use, forced upon the Old World by taxation and high fuel costs, while in this country it has been brought about by the research work of the engineering staffs of the factories, conducted on the race courses, particularly in the five-century events over the Indianapolis two and one-half mile brick course.



## Little Prospect of Increased Schedules Before Mid-July

**With General Conditions Sound, Automotive Industry Should Follow Wholesome Trend**

NEW YORK, June 23.—The automotive industry is experiencing the lull common to this season of the year with little probability that it will increase schedules to any extent before the middle of next month at the earliest. The mid-summer let-down is affording many manufacturers an opportunity to put their plants in shape for the resumption of heavy operations on new models, some of which have already appeared.

With general business reported fundamentally sound it is felt that the industry will continue to follow a wholesome trend and keep on a level with sales and production in other lines of activity. There is no reason to believe that the relative position it has held for months will be lost now. Conditions within the industry itself are good, with inventories low and a general disposition to keep intact all forces in the operating organization pending a pick-up in schedules, or the reopening of such factories as have closed or will close for the usual vacation and overhauling period.

### Dealers Not Loading

Automobile dealers are concentrating their efforts on moving stocks and not increasing them and report that with the improvement in the weather there has been a fairly strong forward movement in sales. In some cities the number of cars sold thus far in June is well ahead of last month, although not on a par with the record of June a year ago, which was phenomenal. More summer-like weather has brought back into popularity the open model of car for which up to this time this year the demand has been below normal.

By July 1 it is believed that stocks will be so far depleted as to warrant more extensive operations on the part of producers. Prospects are held out for a fair volume of business in July and August, normally slow months.

Tire sales have increased under the impetus of reduced prices or the equivalent and inventories of the finished product both in the hands of manufacturers and dealers should show a marked decline this month. Production in tire producing centers is reported at a low point.

The parts branch of the industry continues to follow the pace set by car manufacturers and its activity next month will depend upon the operations in the car producing field. All branches of the industry, doubtless, will feel a stimulus with the conventions of the principal political parties out of the way and the atmosphere somewhat clarified because of it.

## REO VACATION

LANSING, Mich., June 23.—The Reo Motor Car Co. will close for the annual vacation of two weeks, July 4. The Motor Wheel Corp. has adopted the same plan, closing for two weeks on June 30.

## Week's Retail Volume by Nash Is One of Best Ever Recorded

KENOSHA, Wis., June 23.—The week ending June 14 was one of the biggest weeks in point of retail deliveries in the history of the Nash Motors Co., according to a factory statement. "Sales reports received by the factory from distributors and dealers throughout the country," the statement asserts, "unfold a story of active buying of new cars that has been equalled by few similar periods in the past seven years."

"As indicating the buying during the week mentioned," said E. H. McCarty, general sales manager of the Nash company, "our sales reports show, for instance, that New York delivered at retail 94 cars and 62 were delivered at retail in Chicago. The figures for the week in Buffalo were 27 cars, Cleveland 24 cars, Boston 21 cars, Pittsburgh 20 cars and New Orleans 16 cars."

According to reports received at the Nash factory, indications are for a continuance of this fast pace throughout the balance of June.

## Gardner Pushed to Limit to Meet Demand of Orders

ST. LOUIS, June 23.—"Despite the fact that this is presidential year, reports from Gardner dealers and distributors throughout the country indicate a continued brisk demand for our cars," says Russell E. Gardner, Jr., president of the Gardner Motor Co., Inc., of St. Louis.

"As far as Gardner is concerned, we are working on full schedule trying to keep pace with the demand that this attitude on the part of the car-buying public has created. Though our production schedule for 1924 is the largest in our history we have been pushed to the limit to keep up with the orders Gardner dealers in all sections of the country are sending in. We look for a further acceleration in sales during July, August and September."

## FIFTH AVENUE ONE WAY IN RUSH

NEW YORK, June 23.—A radical step in the way of bringing about traffic reform in this city has been attempted by the police department which announces that Fifth Avenue will be a one-way street during the afternoon rush hour. It is said that within two weeks this change will go into effect whereby only northbound traffic will be permitted on the famous thoroughfare between 5:30 and 6:30 P. M.

## Factories Offer Concessions to Clear Way for New Models

**Practice of Making Special Offers to Dealers Used More Generally Than Ever**

DETROIT, June 23.—The closing weeks of June have to an extent become a race in a certain group of factories, a race to clear out and sell all cars of present models at the factories and in dealers' hands. The closing out of the old lines will be immediately followed by the introduction of new models. Important tactical sales advantages are expected to accrue to the factories getting their new lines on display first.

Special sales concessions have been passed on to dealers by these factories, concessions which may be used in any way the dealer sees fit to apply them for the speeding out of the old cars. As a result of these special inducements to buyers it is regarded as assured by these factories that their dealers will be cleared out of old stock quickly and will be ready to start receiving shipments of new models in July.

The introduction of price concessions to clear out old models quickly while not exactly new is being used more generally this year than ever before and indicates somewhat that the industry is brushing up on its merchandising practice.

From the dealer angle the special concession method of closing out lines is especially satisfactory, not only because it helps him to move the line out quickly, but because it permits him to tell the buyer why special concessions are made. There is no customer ill-will engendered by the buying of a car which in a few days becomes a retired model if he has been in on the "secret" and has been taken care of in his purchase of the retiring car.

The effect of new model presentation in the coming month will mean production in these factories will be resumed which will have a generally stimulating effect upon the industrial situation in this district. This is especially true as the companies presenting model changes are among the largest producers and their closing for factory changes incidental to new models has been responsible to a large extent for the general slowing down here.

## 4 NEW K. C. ENTRIES

KANSAS CITY, Mo., June 23.—Four new entries have been filed for the 250-mile national championship on the Kansas City Speedway July 4. They are Frank Elliott and Wade Morton, with Miller Specials; Antoine Mourre, with a Mourre Special, and Ira Vail, with a Vail Special.

## Battery Makers' Association Adopts Creed for Business

### Delegates Take Stand for Truth in Advertising and Worth-While Guarantees

CEDAR POINT, O., June 23.—While sweltering weather made the sands a furnace and the lake a refuge, members of the National Battery Manufacturers' Association today held their first regular meeting here since organizing last March.

Representatives of battery manufacturers, parts makers and allied lines took their stand for truth in advertising, guarantees that mean something and assistance to dealers, and adopted a set of objectives which should clarify the battery business and help to make it a better business from the standpoint of manufacturer, dealer and car owner.

B. L. Shinn, special representative of the National Vigilance Committee of the Associated Advertising Clubs of the World, spoke on the work being done to eliminate advertising that is wrong, due either to carelessness or criminal intent.

"Makers of patent electrolyte are the chief offenders," said Mr. Shinn, "and we try by persuasion to show such concerns the error of their ways. If that fails, we resort to publicity. In one case we investigated and found that practically all of the claims made for one such solution were untrue, so we put out a pamphlet exposing the fake nature of the concern and its product and circulated about one hundred thousand copies to battery stations and trade papers.

#### Due to Carelessness

"In other cases untruthful advertising is due to carelessness, where the flowery efforts of advertising agencies are not properly checked, and where the facts and the advertised statements do not correspond. In such cases it is usually sufficient to bring the matter to the attention of those in authority. The statement as to guarantees is probably the way that most advertising deviates from the truth, for the guarantee as the battery maker interprets it means an entirely different thing from its statement as understood by the car owner.

"These efforts of ours," continued Mr. Shinn, "do not result in limiting advertisers, but on the contrary they make advertising worth one hundred cents on the dollar by building up public confidence, without which advertising is worthless."

A significant feature of the convention was the almost unanimous adoption of suggestions presented by R. D. Mowry of the Universal Battery Corp. One of these suggestions, after outlining work that should be done, was that a paid commissioner or secretary be employed to handle the work of the association, and to make this possible, the meeting unanimously approved raising the nomi-

nal \$5 dues to \$100 for members and \$50 for associate members.

#### Creed Adopted

A creed or set of objectives, prepared through the efforts of Mr. Mowry, was adopted as follows:

A. To promote an enlarged and better acquaintance and more friendly intercourse amongst the members, who will, in all reasonable, lawful and proper ways work collectively and individually toward promoting the best interests of the trade.

B. To discuss subjects of interest and value to the industry in which its members are engaged.

C. To establish and circulate ethical principles of fair dealings and practices for the common good of the industry and the public served thereby.

D. To promote truth in advertising, avoiding all statements which might create public distrust in the industry as a whole.

E. To study the dealer's problems and assist him in solving his merchandising and service problems.

F. To co-operate with and be of assistance to similar and allied associations, always taking an active and united interest in the advancement of the battery art.

#### Specific Objectives

Specific objectives which would be of immediate benefit to battery manufacturers were adopted as follows:

1. To tell the truth in advertising, and to place no copy with those publications which carry unsound advertising.

2. To discontinue soliciting business on a consignment basis to new accounts.

3. To adopt the standard terms of 2 per cent 10 days or 30 days net, where satisfactory credit relations have been established.

4. To remove the tariff on lead, and to enact legislation for the prevention of price manipulation.

5. To work with the other automotive associations in effecting the repeal of tax on batteries.

6. To urge the reclassification of batteries and parts for the purpose of reducing freight rates.

7. To co-operate and frankly give correct credit information to fellow members when requested.

8. To collect and distribute data of general interest to all members.

9. To exert combined pressure on the manufacturers of material entering into the making of storage batteries, in respect to their selling to the service station at wholesale or manufacturers' prices.

#### Recommendations

It was also agreed to promote as much as possible the success and prosperity of the battery dealer by recommending:

1. Adopting a charge for service.

2. That he make no allowance for the old battery other than the actual junk value, this allowance to be 5 per cent of

## Motors and Bikes School Prizes

PARIS, June 23.—Automobiles, motorcycles and bicycles are to replace some of the gilt-edge red-bound volumes which for years past have rewarded the successful pupils in the elementary and high schools of France.

The change has been made possible by the generosity of the Peugeot Co. which has offered the machines to the education department of the French government.

the retail price of the new battery, and to be published by the manufacturer in form of an exchange price.

3. A fair and profitable scale of charge for rentals, repairs and recharging.

4. Organizing local battery men's associations.

5. The introduction and enforcement of local ordinances and state laws for the protection of rental batteries.

These methods of producing better business conditions for the dealer, while benefitting him primarily would, of course, benefit the battery manufacturer, by giving him a more reliable outlet for his product.

The resignation of Mr. R. B. Crane from his position as first vice-president was read and accepted and R. D. Mowry, formerly second vice-president, was elected to take his place. Leon Percy of the Cooper Corp. was elected second vice-president in Mr. Mowry's place.

The next meeting was scheduled for Friday and Saturday, Sept. 19 and 20, at Niagara Falls, N. Y.

## Velie Expects Business to Set New Summer Precedent

MOLINE, Ill., June 23.—"The automobile industry has seen lots of surprises. Time and again predictions of bad business have not come true and just as often predictions of good business have fallen by the wayside. Today I believe we have a new era of surprises. For the first time, summer business this year is going to set another precedent and show a bigger volume of sales than the first part of the year."

Such is the opinion of F. E. Bradfield, vice-president of the Velie Motors Corp., of Moline. Mr. Bradfield has recently returned from a trip around the eastern part of the United States, where he says that in every place where the worker was employed and good weather prevailing he found cars moving faster than ever before at this time of year. Velie is operating on full schedule, working full time on Saturday and on Sunday and has lost only a day and a half in operation since the first of the year, according to information from the factory.



## Banker's Attitude on Motor Car Unchanged, Says Speaker

Representative of Financial House Addresses Merchandising Meeting in St. Louis

ST. LOUIS, Mo., June 23.—About 500 automobile dealers, accessory dealers and maintenance men gathered at Westminster Hall Wednesday evening, June 18, to attend a merchandising meeting under the auspices of the Automotive Accessory Dealers of St. Louis, and over which R. E. Lee, manager of St. Louis Auto Dealers' Association, presided.

John G. Lonsdale, president of the National Bank of Commerce of St. Louis, was to have addressed the automotive men on "The Banker's Revised Attitude Toward the Motor Car." But Mr. Lonsdale was unable to be present and his assistant, Walter B. Weisenberger, made the talk in his place.

Mr. Weisenberger said that the banker had no "revised" attitude toward the motor car, that his attitude was the same now as it was yesterday and last year.

### Basis for Credit

"The best basis for a line of credit, of course, is the financial statement giving a true insight into the stability of the firm which desires credit. In making up a financial statement it must be borne in mind that the 'used car' item is always subject to the closest scrutiny. The banker knows that the used car has been the greatest danger and nuisance with which the automobile dealer has had to contend and that the banker when he sees used cars listed on a financial statement must observe due caution as to their worth."

Frank C. McDonald, president of the St. Louis Automobile Dealers' Association, presented his ideas of how the dealer should handle accessories to help meet overhead and increase his income.

"Because the times are so tough on an automobile dealer, because competition is so keen and because an automobile dealer today must sell twice the number of units to make a possible 22 per cent greater earning now than he did in 1920, it becomes necessary for the automobile dealer to cast about him for some means of expanding the field of his possible sales. The accessory undoubtedly affords the dealer a legitimate field for his operations and he should make effort to so display his stock of accessories and so push them that their sales will help him pay rent, is nothing more."

### Reconditioning Work

H. E. Westmoreland, sales manager of McQuay-Norris Mfg. Co., told the automotive men that from the maintenance standpoint it appeared that the thing for accessory and maintenance establishments to do was to add a reconditioning plan to their business. He reminded the audience that the motoring public spent nearly a half billion more for mainten-

## IMPORTANT NOTICE TO MOTOR AGE READERS

Al Lipper, President

Edward Lipper, Vice-President

Geo. Lipper, Sec'y and Treasurer

### LIPPER MOTOR CAR COMPANY

DISTRIBUTORS

PASSENGER CARS  SPEED WAGONS

SALESROOM 204706 TRAVIS ST.  
PHONE PRESTON 1079

HOUSTON, TEXAS

June 17, 1924.

Motor Age,  
5 Wabash St.  
Chicago, Ill.

Gentlemen:

We had a Representative to call on us today soliciting contract for a magazine called ~~Motor Age~~. This gentleman claiming that they have taken over the Motor Age and hereafter this magazine will only be known as the ~~Motor Age~~. We have just renewed our subscription with you and we would like for you to inform us if this is correct.

Please let us hear from you at your earliest convenience, we remain,

Yours very truly,

LIPPER MOTOR CAR COMPANY.

By   
Vice-President.

EL:MC

The above letter is reproduced in order that MOTOR AGE subscribers and the automobile trade in general may be warned against similar representation. In justice to the publishers the name of the publication represented by this dishonest solicitor is eliminated from the letter, for the publishers are reputable and certainly do not endorse such deceptive methods. MOTOR AGE has no connection whatsoever with the magazine represented by this man.

ance last year than it did for new cars.

Joseph A. Schlecht, president of the Mound City Auto Co., Gardner and Auburn distributor, talked on the courtesy which is necessary in business and reviewed the history of the automobile industry in St. Louis.

An "Ask 'Em to Buy" talk was made by Joseph Kellerman, sales manager of the Hudson-Frampton Co.

To close the program, Arthur R. Mogge, merchandising director of the Automotive Equipment Association, presented the firm of the A. E. A. which is being shown to stimulate sales of maintenance and accessories.

### ANNOUNCE SALON DATES

NEW YORK, June 18.—Dates for the twentieth annual automobile salon in New York and Chicago are announced. The New York exhibition will be held in the Commodore as usual, Nov. 9 to 15, inclusive, while the Chicago display will be held the last week in January.

## Stewart-Warner Corporation to Buy Vacuum Tank Rights

CHICAGO, June 23.—Rumors that the Stewart-Warner Speedometer Corporation is negotiating for acquirement of large vacuum tank rights with the intention of materially extending its line of production are confirmed in a statement issued by C. B. Smith, president of the Chicago organization. Mr. Smith's statement is as follows:

"Negotiations which have been pending between the Stewart-Warner Speedometer Corporation and the Zorzi Corporation, of New York, are now being completed whereby the former company will purchase the assets of the Zorzi Corporation, including their patents on vacuum tanks, thereby settling vacuum tank infringement suits between the Stewart-Warner Speedometer Corporation and the Zorzi Corporation.

## Low and Medium Price Axle Field Abandoned by Timken

**Detroit Company Announces That Its Output Will Be for More Expensive Cars**

DETROIT, June 23.—Discontinuance by the Timken Detroit Axle Co. of further manufacture of axles for cars in the low and medium priced field has been announced. This comes as a result of determination of the executives to place the company upon a dividend paying basis. There is no money for a unit maker such as itself in the low and medium priced business, the company declares, and there does not promise to be under competitive conditions existing.

In cutting adrift from this line of business, the company will confine itself so far as passenger cars are concerned, to making axles solely for manufacturers of high priced cars, of which it has a number of leading accounts and which is profitable business. Coupled with its truck and bus business which is steadily developing, the company is preparing itself to do business only in those fields where the opportunity for profit is favorable.

### All in One Plant

Discontinuance of its low and medium priced business means the discontinuance of the Waterloo avenue plant and the confinement of all operations to the Clark avenue plant. Lines which are to be continued will be transferred to the Clark avenue plant at once and steps taken looking toward the disposition of the Waterloo plant. This will be offered for sale.

The company declares the Waterloo avenue plant has not been on a money-making basis since the war and its continued operation has to a large extent resulted in conditions which made it impossible for the company as a whole to show a favorable return. Practically all of the business which it is now discontinuing has been carried on at this plant so that the abandonment of the field makes it no longer necessary to keep it.

The low and medium priced car field does not offer a suitable basis of profit to the units maker, say executives, particularly under competitive conditions as they exist in the unit manufacturing fields. This is due to the fact there is too much capacity for the amount of business offered, resulting in conditions under which the legitimate parts maker cannot acquire business at a price that is favorable, it is declared.

### Unsatisfactory on the Whole

In addition to the competitive difficulties of the parts makers' position, there is, furthermore, the condition under which he has no protection on the business he acquires. Contracts and orders are made, based upon definite shipping and manufacturing schedules which can-

## Edsel Ford Builds Ornate Home

SEAL HARBOR, Mich., June 23.—Construction is going ahead rapidly on the new summer home on Ox Hill which Mr. and Mrs. Edsel Ford are to occupy.

The property was bought by Mr. Ford about two years ago and the homesite towers above all other elevations of the countryside.

The building is to be made faced granite hewn from the ledges on the side of the mountain. One of the features of the place will be a rugged driveway extending around the house. This, too, will be made of local granite.

It is said that the improvement will cost around \$2,000,000.

not be worked out in a majority of cases, owing to the inability of the customer to take shipments in the quantities originally designated and upon which the success of the contract to the parts maker is largely based. On the whole, the business has been decidedly unsatisfactory, executives declare, and it is doing its part to shrink down the capacity to an extent more in conformity with the amount of business to be had.

Bankers have assured them, say executives, that they are taking a courageous and constructive position, which will result not only favorably for themselves, but the industry as a whole.

Under its plan of concentrating upon axles for high grade passenger cars, buses and trucks, the company declares that it will be in much better condition to take care of its business generally.

Plans which had been under way looking to the manufacture of parts for the replacement field are off, under the new plan of operations, it is declared. The company will carry through all servicing on axles which it has made, but will not manufacture for the general replacement market.

## PRODUCE NEW REPUBLIC

ALMA, Mich., June 23.—The Republic Motor Truck Co. has put into production a new 1½ ton model to be known as Model 10-F. It is an all-purpose type and an outgrowth of the Model 10. A new type pressed steel radiator is one of the noticeable features and drum headlamps are part of the regular equipment. The wheelbase has been considerably lengthened and the frame rails are deeper and thicker. Bosch starting and lighting and a vacuum tank are standard equipment. The Republic driveshaft brake, consisting of two lined contracting shoes, is now used on this lighter model and either pneumatic or solid tires can be had.

## Olds Cash Volume for Five Months Sets New High Mark

**Records Also Broken for Number Cars Sold, Says Announcement by Factory**

LANSING, Mich., June 23.—The greatest cash volume of business in the history of the Olds Motor Works, Lansing, Mich., was transacted during the first five months of 1924, company officials announce. This is doubly outstanding inasmuch as this year Olds Motor Works is selling the lowest priced car it has produced in its entire 27 years of manufacturing experience, with the exception of the little curved-dash "Merry Oldsmobile" of 1900.

The total volume of sales in dollars and cents was 80 per cent greater for the first five months of 1924 than it was during the same period last year. The cash business so far this year even exceeds the previous year of 1920 by a substantial margin. Records were also broken in the number of cars sold during the first five months' period in 1924, compared with previous years. The total number of cars sold during January, February, March, April and May this year is 51 per cent greater than for the same period last year; 158 per cent greater than in 1922; 138 per cent greater than in 1921 and 67 per cent greater than in 1920, the previous high record year in cash sales volume.

In addition to showing an increase for the first five months' period, each month's sales exceeded those of the previous month by favorable margins. May figures exceeded those for April by 9 per cent, for March by 66 per cent, for February by 30 per cent, and for January by 50 per cent. May retail sales for 1924 also exceeded those for May 1923 by 81 per cent.

## First Week June 20 200 Per Cent Ahead for Willys-Overland

TOLEDO, June 23.—Reports from all sections of the country to the Willys-Overland sales department here indicate that the first week of June produced 20 per cent more sales than the same week a year ago. The first seven days of the month also showed a 15 per cent pick-up over the average week for May of this year which month was ahead of May, 1923. Local distributors expect sales volume to be up to production schedules by July 1.

## SALESMEN SEE FACTORY

AKRON, O., June 23.—More than 800 Firestone Tire & Rubber Co. branch managers, salesmen and other representatives from all parts of the world spent three days at the factory recently to study the construction of tires and methods of distribution.



## Ford Company Is Considering Accessory Production Program

### If Move Is Made Factory Will Sell Through Dealers and Service Stations

DETROIT, June 23.—Reports that the Ford Motor Co. is on the point of starting manufacture of a line of accessories for its cars which are to be sold through its dealer organization are to an extent premature, officials declare, though it is admitted that the company is not only considering such a plan, but has for some time been conducting an investigation as to the advisability of including certain items of equipment in its line of products.

The report that such action is near is due, in large degree, executives say, to the fact that recently the company has included such items as windshield wiper, door lock and rear view mirrors as standard equipment on some of its closed models and is manufacturing this equipment itself. These items are not being sold through dealers for general sale, but to this time are only for standard equipment on the closed models.

Furthermore the investigations the company has been making as to traffic regulations in different states and the special provisions of insurance where locking equipment is included, has given the impression the company was ready to start manufacturing accessories. Probably only the fact that the investigations are not fully complete prevents making definite announcement at this time as to the company's accessory policy.

#### Items Commonly Bought

Such announcement, it is declared, will not be made within the next three months but will be definitely determined upon later on. Should it go in for accessory manufacture, these will not include more than half a dozen items, but these will be those generally regarded as necessary for the safe operation of the car and as such the ones commonly bought.

The list as outlined at company offices would probably include speedometer, bumpers, steering wheel locks or lock wheels, windshield wipers, stop lights and rear view mirrors. These would be sold through all company dealers and service stations and would be built for ready installation. Cars as shipped would also be so designed as to make the installation of the accessories practically integral.

Experience of the trade has shown that in a large number of instances, if not the majority, the sale of these items as outlined above accompanies the sale of a new car, particularly in the case of city business. In this way the car purchaser gets the advantage of time payments on the accessories and the difference in the cost spread over a period of months is so

## Association Buys Building

BALTIMORE, Md., June 23.—The Automobile Trade Association, Inc., has purchased a large building at 1200 St. Paul street and will move its quarters to the new location about August 1. The building is a four-story structure and ideally arranged to supply the needs of the association.

It will provide a large meeting room, dining room and lounge room on the first floor. John E. Raine, secretary, will have his office on the second floor and the other two floors will be used for bachelor rooms for the members and for visiting auto trade men.

A special committee has been named to take charge of improving the new home. It consists of Joseph Manuel, Louis Fox, Harry Reeves, E. T. Backus, A. J. Hunter and Frank Olmstead.

slight as to make their sale practically certain.

#### Has Factory Facilities

No announcement is made by the company as to its plans for the manufacture of the items, as with the exception of the number that are now being made for standard equipment on the closed models, it has not fully determined its action. The company has facilities now existing for the manufacture of any or all of the equipment specified in its many manufacturing plants about the country, and is already making glass, lamps, wheels and other items at various points.

The attitude of the company for some time has been that it should be participating in the accessory business that the sale of the car has made possible. The reason that it has not undertaken a larger activity in this direction previously has been due to the fact that it has been concentrating entirely upon getting its manufacturing facilities up to a point fully covering the market for the car.

That the manufacture of accessories is now receiving serious consideration indicates that with its car manufacturing facilities now at a point aggregating ten thousand daily when required, it will not seek further expansion in this field for some time. Its plans for production facilities on parts and material entering the car may also be regarded as practically complete.

#### RECORDS BROKEN

AKRON, O., June 23.—The India Tire & Rubber Co. announces that the business for the past three months has broken all previous records in the company's history and that business during the period was more than 100 per cent greater than that of the same period last year. Production is at capacity.

## G. M. C. Stockholders Adopt Capital Simplification Plan

### Holders Given Until Dec. 31, to Exchange Shares for Those of New Issue

NEW YORK, June 23.—As expected, stockholders of the General Motors Corp., at the special meeting held in Washington last week, adopted the charter amendments proposed by the directors for the purpose of simplifying the capital structure of the corporation.

Under the new scheme as approved, the three issues of senior securities have been consolidated into one issue of 7 per cent preferred stock, which will constitute a prior preference on the entire assets, after debts, of the corporation. The holders of the present 6 per cent preferred and 6 per cent debenture stocks will be given the right to exchange their shares for the 7 per cent preferred stock on the payment of \$10 per share in cash. The present 7 per cent debenture certificates may be exchanged for the 7 per cent preferred stock on a share for share basis without cash payment. Exchanges may be made at any time before Dec. 31, 1924.

The charter amendments also provide for the exchange of the present outstanding common shares for new common shares on the basis of one new common share for each four shares of present common stock outstanding, thus reducing the 20,646,400 common shares at present outstanding to 5,161,600 shares. The date of the exchange for common share will be fixed later.

The corporation states that as of March 31, 1924, its capital position is as follows:

329,316 shares of 7 per cent debenture stock.....	\$32,931,600
608,010 shares of 6 per cent debenture stock.....	60,801,000
161,834 shares of 6 per cent preferred stock.....	16,183,400
20,646,397 shares of common stock without par value, carried at \$10 a share .....	206,463,970
Surplus .....	132,176,118
Total .....	\$448,566,083

Upon completion of exchanges of all securities (if all are exchanged) the capital stock position based on March 31, 1924, statement may be summarized as follows:

1,090,160 shares of 7 per cent preferred stock.....	\$109,016,000
5,161,600 shares of common stock without par value, capitalized at \$50 per share.....	258,080,000
Surplus .....	88,258,523
Total .....	\$456,254,523

#### NEARLY ALL FROM U. S.

WASHINGTON, June 23.—Out of thirty-five automobiles imported at Rio de Janeiro in March thirty-three of them came from the United States and one each from France and Italy.

## Fifteen Cars Entered for Kansas City Classic July 4

**Expect Record Crowd to See 250-Mile Grind on Missouri's Great Board Circuit**

KANSAS CITY, Mo., June 23.—Fifteen cars have been entered for the National Championship 250-mile motor classic at the Kansas City Speedway, July 4.

The races are being handled by L. J. Smyth, licensee. Last year's attendance was about 45,000, and the indications are for a considerably larger patronage this year, in view of the fact that this will be the only race staged here for the season.

Following are the cars and drivers entered—one driver not yet having been named for one of the Miller Special entries:

**Durant Specials**—Harlan Fengler, Harry Hartz, Jerry Wonderlich, Fred Comer.

**Miller Specials**—Jimmy Murphy, Bennett Hill, Tommy Milton, Bob McDonogh and one other.

**Duesenberg Specials**—Joe Boyer, Ernie Ansterberg, Peter DePaolo, L. L. Corum.

**Schmidt Special**—Ora Haibe.

**Studebaker Special**—Earl Cooper.

The lists close June 23.

## Gives Rule for Lengthening Life of the Truck and Tractor

WASHINGTON, June 23.—Rapid adoption of power machinery during the past decade forms one of the outstanding developments in American agriculture according to U. S. Department of Agriculture experts who recently completed a comprehensive survey of this situation, including a number of tests at the University of Maryland. "Twenty years ago," the experts observe, "the small farm engine was a curiosity, ten years ago the same was true of the tractor and truck, while today there are but few farms which do not have at least one of these machines, and many have one or more of each."

To obtain long life for a truck and tractor the experts recommend the following: 1. Start with a good machine. 2. Be alert for small noises which warn of beginning troubles, and remedy them promptly. 3. Replace worn parts in time. 4. Do not overload. 5. Lubricate thoroughly with good oil. Important in the extreme is the mechanical skill of the operator, and for this position the farmer's son is usually the best qualified.

### M'LAUGHLIN RETIRES

MONTREAL, June 23.—George W. McLaughlin, treasurer of the McLaughlin Motor Co., General Motors' Canadian subsidiary, has retired from office after years of service in the business founded by his family 38 years ago. Mr. McLaughlin's brother, R. S. McLaughlin, continues as president.

## Report Shows Automotive Industry Continued to Maintain Surplus of Workers During May

Exception Found in Michigan Where Progress Is Noted With Schedules for June Ahead of Those Preceding Month

WASHINGTON, June 23.—In company with other industries, the automobile industry during the month of May continued to show a surplus of workers with many plants operating on a slow basis, it is revealed here in the latest monthly digest of general employment conditions just made public by the U. S. Employment Service of the Department of Labor.

"In Michigan, however," the digest states, "it is felt that the industry is making progress at this time and schedules for June are ahead of those for May."

Reports from Rochester, New York, and the Harrisburg industrial district of Pennsylvania which includes the Steelton and Middletown centers are exceptions to the generally drab picture presented of working conditions in the automobile industry in Indiana, Michigan, Ohio and Wisconsin.

At Rochester, it is reported that the industries manufacturing automobile parts are operating overtime and "employment conditions in this line are very satisfactory."

In the Harrisburg district it is reported that seasonal activities in the automobile repair shops and garages have increased the demand for truck drivers, helpers and auto mechanics.

### Reports on Districts

Following are concise reports from the principal automobile centers:

**Detroit industrial district**, including Hamtrac, Highland Park and Wyandotte—Most plans are running, though some, such as the automobile plants, are operating only part time. Approximately 20,000 workers are working an average of 42 hours a week in place of a normal 50-hour week.

**Flint, Mich.**: There is a surplus of workers here, and at this time three

automobile plants are operating only part time, affecting 27,100 workers.

**Kalamazoo, Mich.**: A motor car company and a cab company have been closed down completely for some time, affecting about 500 in both places.

**Muskegon, Mich.**: At this time there is a surplus of workers in foundries and plants related to the manufacture of automobiles.

**Jackson, Mich.**: There is a surplus of factory workers and semi-skilled men in the automotive lines.

**Saginaw, Mich.**: A motor company is placing machinery in an old plant here, employing about 80 men.

**Indianapolis, Ind.**: There is a surplus of workers in automobile lines and reductions in working forces have occurred. Two automobile plants are running on part-time schedules.

**South Bend, Ind.**: Last month one automobile plant released some workers; all factories are operating, but not on fulltime schedules.

**Muncie, Ind.**: There is considerable unemployment among automotive workers in this city.

**Syracuse, N. Y.**: Automobile plants, employing a like number of workers, are operating three days a week, and a gear manufacturing plant, employing 5,000 is working only four days a week.

**Troy, N. Y.**, including Watervliet, Green Island and Cohoes: Automobile plants at Green Island have reduced their working schedules to five days a week.

**Fond du Lac, Wis.**: All plants are running except a tire company, which is operating only 40 per cent of capacity.

**Toledo, O.**: There is a surplus of workers in the automobile and automobile accessories industries at the present time, owing to many workers being laid off from some of the larger factories.

### WANT CONSTRUCTIVE PROGRAM

WASHINGTON, June 23.—House investigation of the aircraft industry will be carried forward during the summer recess of Congress, Chairman Florian Lampert, Wisconsin, chairman of the special committee appointed for that purpose, has announced.

The inquiry will be conducted primarily with a view to working out a constructive program for aircraft manufacture and operation, along standardization of motors and machines.

### TRACTION LINE GETS BUSES

INDIANAPOLIS, June 23.—"If the people want to ride on rubber, we will provide that facility," said Mr. Harry Reid, president of the Interstate Public Service Co., which runs a traction line between Indianapolis and Louisville, in announcing purchase by his company of eleven motor buses which will operate between Indianapolis and Franklin in bus service as an adjunct to the traction main line of the company. Later it is possible that buses of the company will operate down as far as Columbus.



## Compulsory Liability for Car Owners Big Issue Next Year

### Question Will Be Threshed Out by State Legislative Bodies in 1925

NEW YORK, June 23.—In the opinion of the Motor Vehicle Conference Committee compulsory liability insurance for every owner of a motor vehicle will be one of the chief automobile subjects discussed by the 42 state legislatures which meet next year.

With an open mind in the matter and desiring to get the consensus of opinion of those on whom such a tax would fall, the committee, through Secretary Russell Huffman, is sending out a questionnaire to all automobile dealers' associations and owners' organizations. Five questions are asked, as follows:

1. Has your club or association taken any stand on compulsory automobile liability insurance?
2. If in favor of such insurance, how much, in your opinion, should the amount of the minimum liability under such policy of compulsory insurance be?
3. Should this insurance be written or issued by (a) existing private insurance companies, (b) by the state, (c) mutual companies organized for that purpose, (d) or by all of them?
4. Do you think compulsory insurance will (a) reduce the number of motor vehicle accidents, or (b) increase the number of accidents by making the driver more careless?
5. What is your opinion of a plan of insurance which will operate similar to workmen's compensation insurance?

Secretary Huffman also attaches arguments for and against such legislation as they have come to the committee. As outlined they are:

#### A

Proponents say: That it will reduce the number of accidents on the highways by making the driver more careful.

Opponents say: That it will not reduce the number of accidents, but rather will increase them because it will have a tendency to make every driver more careless.

#### B

Proponents say: That it will insure compensation for injury to persons or damages to property from car owners otherwise irresponsible.

Opponents say: That drivers would be much more careful if no one were allowed to carry insurance, or if only co-insurance was permitted—that is, the owner assuming part of the loss.

#### C

Proponents say: That it will insure compensation to the wife, children and other dependents for injuries to or death of the husband or chief means of sup-

## 26 Miles Without Mishap B'gosh

ELKADER, Ia., June 23.—Albert Allen, a member of Allen Bros. automobile dealers here and at Oelwein, recalled events of 20 years ago, when he was a pioneer in the business, upon reading a clipping from the Clayton County Democrat, June 15, 1904:

"Albert Allen, accompanied by Jos. Lamm, made the journey to West Union and return last week without a mishap. The roads were rough and they were delayed somewhat by meeting and overtaking teams (the laws being very stringent touching such matters), yet going their time was three hours and returning, but 2 hours and 30 minutes, the distance being 26 miles. On their return they covered the distance from Elkader to Rothlisberger, 12 miles, in an hour and 10 minutes and were delayed ten minutes. The auto consumed about a gallon and a half of gasoline on the return trip, which at 14 cents a gallon amounts to 21 cents. The Allens know how to manage these machines."

port, from the car owner who is judgment proof.

Opponents say: That the best way to reduce the number of accidents is to strictly enforce the already existing traffic laws and regulations.

#### D

Proponents say: That the cost of such insurance would not operate as a burden on the motor vehicle users, as the cost could be kept at a minimum by the state undertaking to issue such insurance.

Opponents say: That, assuming the lowest estimate, the cost of such insurance will add \$450,000,000 annually to the cost of operating motor vehicles in the United States.

Opponents have two other arguments. One is "that the amount of uncompensated loss for which this expense would be entailed is unknown and should be determined before undertaking compulsory insurance." The second is that there is no assurance that the rates will be kept at a minimum.

While a majority of legislatures last year considered bills calling for compulsory insurance for every owner of a motor vehicle, not one of the measures was enacted into a law. There are 19 states, however, that require bonds or liability insurance from motor vehicle common carriers.

It is estimated that not more than one-third of the owners in the United States carry liability insurance at the present time.

## Hayes Wheel Type Infringes Michelin Patent, Rules Judge

### Court Holds That Device of Complainant First Success Through Use of Clamps

DETROIT, June 23.—Under decision by Judge Tuttle in Federal District Court here, the rights of Andre J. Michelin as patentee and owner and of William N. Booth and the Kelsey Wheel Co., Inc., as licensees are upheld in the suit bought by these complaints against the Hayes Wheel Co. to restrain this company from manufacturing a type of demountable rim wheel which it was claimed, infringed the patent.

The decision finds that the Michelin patent is valid and that it is infringed by the Hayes Wheel type. The contention of the defendant company that the Michelin patent was invalid in that it was not original but that the inventor had knowledge and made use of ideas embodied in former patents granted for wheels with similar demountable features. The court held, however, that the Michelin patent was the first to successfully accomplish the result sought by use of clamps.

In its defense the Hayes company listed various patents which had been granted in four countries for wheels of this type. The earliest of these in the United States dates back to October 13, 1868, in which one S. Mosher was granted a patent on a box wheel. There were eighteen other patents granted in the United States up to the Michelin patent, it declared, and 12 in France, 12 in England and 2 in Germany.

It was further declared that prior to the issuance of the Michelin patent, July 6, 1909, that this type wheel had been offered for sale in the United States for more than two years. The license to Booth and Kelsey was dated Sept. 22, 1914. The rights as exclusive patentees was contested in view of the exception of the Michelin Tire Co. from the exclusion.

#### HAYES WILL APPEAL

DETROIT, June 22.—The Hayes Wheel Co. will appeal the decision as handed down in the Federal District Court here, in which the Michelin patent was upheld and the Kelsey Wheel Co., Inc., and William N. Booth were held exclusive licensees. The company will proceed with its manufacturing operations, declares President C. B. Hayes, the decision having no effect in this respect.

Lawyers for the Hayes company are proceeding with plans for the appeal which will be carried through as rapidly as possible.

#### NEW HUPP BUILDING

DETROIT, June 23.—Hupp Motor Car Corp. plans to increase its plant facilities by the construction of a block test building, 50x150 ft., to cost about \$35,000. The company also plans to erect a large steel storage building.

## Denver Association Makes Plans for 2-Mile Speedway

### Menu of Dirt Track Events Will Be Offered Fans Meanwhile at Overland

DENVER, June 23.—A season of lively motor racing meets is promised by Denver's newly formed Automobile Club Racing Association, which plans to build a two-mile speedway near the outskirts of the city as soon as funds can be raised. Meanwhile, racing fans will be treated to a series of programs on the one-mile dirt track at Overland Park, Denver's municipal camping ground for visiting motorists. An afternoon of fast events was staged recently and the association promises five more similar programs during the summer, with an extra big feast of speed booked for the Fourth of July.

Sig Haugdahl, in his Wisconsin Special, set a new mile record of 49 1/5 seconds for the Overland track, with Noel Bullock crowding him in 51 seconds and four other winners finishing at marks ranging up to 53 3/5 seconds. Bullock, winner of the 1922 Pike's Peak races, also won a five-mile event in 4:28 and a ten-mile in 8:45. A ten-mile consolation race for non-winners was won by F. B. Merzney in a Fronty Ford in 9:14 2/5. Higley captured first in another five-mile event in 4:24 1/5, with Allen second in 4:33 1/5.

The new association's plan is to stage worth-while programs at a reasonable admission charge and give the fans a pleasing taste of racing. "With about 6,000 persons attending the first meet and with scores of them going out of their way to praise the program and ask for more, we feel assured that our plan will succeed," said Chairman Whiting, "and there is plenty of reason to believe that Denver will have some of America's biggest racing events before many years."

### SLOW DOWN IN PASSING

HALIFAX, N. S., June 23.—An overtaken automobile on the highways of the Province of Nova Scotia, if the driver wishes to let the overtaking car pass, must not only be driven to the right side of the roadway, but must be slowed down to a speed not exceeding 15 miles an hour, according to a measure brought down some days ago by the Minister of Highways and which passed a third reading after a debate.

### NEW OVERLAND COUPE-SEDAN

TOLEDO, O., June 23.—The Overland Champion, brought out in October of last year, has been rechristened the Overland Coupe-Sedan. This body model has practically all of the characteristics of the Willys-Knight model of the same name and it is stated that the change in name was made because of this similarity.

## Mechanics Drop As Car Purchasers

DETROIT, June 23.—Retail sales by the dealer organization of the Paige-Detroit Motor Car Co. for the month of May were again ahead of any previous month and totaled nearly 5,500. Of this total merchants, as a classification on the records of the distribution department of the company, brought 15.8 per cent of the Paiges and Jewetts sold, states Mr. Harry M. Jewett, president of the Paige company.

Foremen, machinists and other skilled mechanics, long leaders as buyers of Paige and Jewett cars, were in second place, absorbing 10 per cent of the entire retail sales. The other sales in the order of their percentages of the whole follow by classes:

Executives and manufacturers.....	9.1
Building trades.....	9.1
Women .....	7.5
Salesmen .....	6.7
Farmers .....	5.2
Physicians .....	4.7
Transportation, railway, express, et cetera.....	4.6
Real estate and insurance.....	4.1
Clerks, accountants, etc.....	3.3
National, county and city employees .....	2.5
Engineers and architects.....	2.4
Hotel, restaurant, pool room, etc.....	2.3
Retired .....	2.2
Taxi and livery.....	1.8
Lawyers .....	1.6
Garage and accessories.....	1.3
Newspapers, printing, etc.....	1.3
Teachers and clergy.....	1.2
Personal service, barbers and laundry .....	1.2
Bankers .....	1.1
Miscellaneous .....	3.0

### LOOK OUT FOR HIM!

A swindler has been reported to be operating among garages and automobile dealers in Iowa recently getting cash deposits on alleged contracts for road signs. In a letter to MOTOR AGE, Selzer Bros. of Mediapolis, Ia., report that a few weeks ago they signed a contract for a road sign the price of which was to be \$15. They paid a deposit of \$6 and after a considerable wait they wrote to the address given on the contract, which was Vitrol Sign Co., Utica, N. Y., and Philadelphia, Pa. Letters sent to both addresses were returned "Unclaimed. Not in directory." The agent gave his name as B. Ingram. He is said to be about 5 ft. 9 in. tall, weighing about 165 lbs., smooth face and slightly dark.

## \$40,535 Net Loss for Stutz Last Year; \$662,378 in 1922

### Annual Report Reflects Vigorous Efforts and Success of the Schwab Organization

INDIANAPOLIS, June 23.—While the annual report of the Stutz Motor Car Co. of America, as of Dec. 31, 1923, shows a net loss of \$40,535 for last year, yet it compares most favorably with 1922, which carried red ink figures of \$662,378. The Charles M. Schwab interests have worked vigorously and the report is indicative of the success they have achieved.

Net sales were increased from \$2,737,218 in 1922 to \$4,297,133, with an operating profit of \$59,986 against a loss of \$284,966 in 1922. Total income was \$74,150 against a deficit of \$278,963 in the preceding year.

Under the Schwab management 1923 was a year of accomplishment in which sales were doubled, the dealer organization increased and the Stutz line pushed to the limit, 2,373 cars being sold. President W. M. Thompson states that "the four-cylinder cars of the model sold during 1923 were sold at a substantial loss," so that the showing the company made was largely due to the six.

The company's balance sheet shows assets of \$7,409,702, including good will of \$2,100,000, and an inventory of \$1,924,122. Cash on hand of \$720,803 is reported and the surplus is \$4,531,441.

### HEAVY TOURIST TRAVEL

MEMPHIS, Tenn., June 23.—The hot weather now prevailing is not only helping the cotton crop, but it has stimulated automobile touring to such an extent that the Memphis Chamber of Commerce, Good Roads Division, is almost swamped with calls for routings. As many as 300 tourists visited the division on one day recently and Thos. B. King, the manager, says they are from every section of the country. Memphis being the only crossing for trans-continental auto tourists between St. Louis and New Orleans, the city has been gaining in the favor of autoists for several years.

### 10 MILLIONTH FORD STARTS

NEW YORK, June 23.—J. N. Gunn, president of the Lincoln Highway Association, officially started the ten millionth Ford on its transcontinental trip June 16 from Times Square. Frank Eulick, veteran race driver, is pilot of the Ford, which will follow the Lincoln Highway to the Pacific Coast. Starting with Kulick and Gilbert Hoag, field secretary of the Lincoln Highway Association, in his Packard. Mr. Hoag is making one of his usual transcontinental inspection tours and will be with the Ford for a day or so.



## WITH THE ASSOCIATIONS

### Ten Apply Daily

ST. LOUIS, June 23.—Checking up results on the membership campaign carried out in May by the officers and board of directors of the National Automobile Dealers' Association discloses that an average of 10 applications a day throughout that month were received by national headquarters.

G. G. G. Peckham of the Ohio Buick Co., Cleveland, president of the N. A. D. A. in 1923, was responsible for 40 per cent of the total of these new applicants.

Of the 21 directors taking part in the campaign only one failed to score.

It was expected that the membership solicitation by the directors would disclose considerable information of value in formulating policies of the association, suggestions from dealers and ideas that would enable the members of the board of the N. A. D. A. to outline future necessary activities. This did not develop.

All reports that have been forwarded by the directors indicate that the more than 300 new members obtained in this campaign by the directors is only the first result and that throughout the year there will be a steady return of applications from this May offensive. The effort by the directors did, however, make fairly certain that many good dealers who could qualify for membership were so harrassed by conditions within the industry that they did not have their interest centered in the possibilities of co-operative effort.

### Truck Parade

PHILADELPHIA, June 23.—The Motor Truck Association of Philadelphia, at its last meeting decided on an innovation this year, in connection with the annual outing, which will be held on June 28. The session was held in the Adelphia Hotel and Frederick Williams, of the White Company, presided. On president Williams' suggestion, it was planned to hold a truck parade in conjunction with the outing.

The parade will be held on the morning of June 28. A committee to work out details was appointed, as follows: William Sutherland, chairman; A. E. Hickey, W. E. Manwaring, Ernest Scheck, Edward M. Burd and Frank W. Tucker. These members will work with the board of directors and the secretary, Harold S. Shertz, in the association's offices in the Liberty Building. It was decided also to invite truck owners in Philadelphia to participate in the parade, regardless of association affiliations.

### Adopt Noyes Plan

HOLYOKE, Mass., June 23.—The Holyoke Automotive Dealers' Association has voted to adopt the Noyes New London used car sales plan. This action

was taken after John F. Noyes of New London, Conn., had explained the plan at a luncheon meeting given by dealers in Hotel Nonotuck. This plan is in operation in several Connecticut cities and provides for a central establishment for buying and selling used cars. A concern will be incorporated here for this purpose as soon as possible and a store opened. This will take over all used car business of the association members. The new concern will continue the practice of making regular reports on used car transactions, as under the Boston plan.

### Secretary Engaged

PITTSBURGH, June 23.—The Clarksburg, W. Va., Automobile Dealers' Association has announced the appointment of J. S. Casey, of Detroit, as its full-time secretary. He will assume his new duties within a week or two. He was formerly assistant secretary of the National Automobile Dealers' Association.

### Memphis Club Joins

MEMPHIS, Tenn., June 23.—Directors of the Memphis Motor Club announce the affiliation of the local organization with the National Motorists' Association. Headquarters of the Memphis Motor Club will be located at the Chisca Hotel. There will be ten departments for handling the work of the organization. Emblems representing the Memphis Motor Club, the standard N. M. A., red, white and blue, will arrive in a few days.

### Oppose Gas Tax

COLUMBUS, O., June 23.—Unequivocal opposition to a gasoline tax without a corresponding reduction of other taxes in Ohio was voiced by officials of the Ohio State Automobile Association, who announced that this subject would head the calendar of legislative proposals to be discussed at the annual convention to be held at Cedar Point June 27-28.

Declaring that "the tax spending elements, regardless of party, are almost solidly behind a gasoline tax which would add to the burden already carried by every motorist," President Fred H. Caley predicted that organized automobile owners would resort to a state-wide referendum if such a law should be passed.

Ohio automobile owners, according to Mr. Caley, pay to their counties and the state nearly \$10,000,000 in personal property taxes which does not go on highways, but to the general tax fund. In addition, more than \$10,000,000 is paid annually in license tag fees, and approximately \$20,000,000 in direct and indirect taxes to the Federal government. A tax of 2 cents a gallon on gasoline

would impose an additional burden of between \$10,000,000 and \$15,000,000.

### Show Automotive Film

BOSTON, June 23.—The Used Car Statistical Bureau, a division of the Boston Automobile Dealers' Association, headed by J. W. Bowman and L. B. Saunders, former dealers, is working in Massachusetts, Maine, New Hampshire and Rhode Island, on an educational plan intended to assist dealers in solving business problems.

The bureau has a motion picture which tells something of the size and development of the automotive industry, and then goes into dealer problems such as financing, used car buying and selling, direction of salesmen and so on.

Mr. Saunders, Mr. Bowman and other speakers usually talk before the film. Meetings have been held in the past few weeks in a larger number of cities and will be carried on throughout the summer and fall in virtually all of the New England states.

### New Service Association

CHARLOTTE, N. C., June 23.—The Gas and Oil Dealers' Association of Charlotte and the tire dealers have formed a new organization to be known as the Charlotte Automotive Service Association. It will be affiliated with the Automotive Merchants' Association. The gas and oil dealers have been organized for some time. Recently they invited the tire dealers to come in with them. The invitation was accepted and the name of the organization changed.

### Battery Men Plan Picnic

QUINCY, Ill., June 23.—The Quincy Battery Men's Association at a recent meeting fixed July 4 as date for their annual outing and Earl McCannon, president, Milton Breder, secretary, and Herbert Abbott, chairman of the executive committee, are arranging details for the picnic. Eleven plants hold membership and the organization, launched last fall, is proving worthy as a business and social enterprise.

### 48 Aid Stations

SAN FRANCISCO, June 23.—Forty-eight official mechanical first aid service stations were supplying free emergency road service and towing to members of the California State Automobile Association, in 40 different centers of population at the end of May, according to announcement by the association. Extension of the service to cover all the 45 northern and central counties of the state is planned by the association.

### Army Trucks for Roads

WASHINGTON, June 23.—A bill authorizing the transfer of \$12,000,000 worth of army trucks and tractors to the Agriculture Department for work on public highways was passed by the House and sent to the Senate.

## BUSINESS NOTES

The Cleveland Auto-Ade Co., Cleveland, O., has been chartered with an authorized capital of \$10,000 to buy, and sell gas, oils, tires, tubes and auto accessories. Incorporators are A. Stanley Ginn, Harry Sturn, H. Sturn, E. Venig and C. Goldman.

The I. G. Monroe Co., Youngstown, O., has been chartered with an authorized capital of \$20,000 to buy, sell and deal in gas, oils, greases and automobile accessories. Incorporators are I. G. Monroe, Isabella Monroe, Dr. B. F. Glass, A. N. Richards, F. M. Stoner and A. C. Logan.

The Lamar Chevrolet Co. of Paris, Texas, has been incorporated. The capital stock is \$15,000. Among the incorporators are S. W. Campbell, L. A. Tittle and D. E. Griffin.

The Oak Cliff Chevrolet Company of Dallas, Texas, has been chartered. Capital stock is \$40,000. Among the stockholders are Ed. Hendrickson, Jack Coates, and C. W. Baber.

The Bailey Motor Company of Plano, Texas, has been incorporated. Capital stock is \$10,000. Among the incorporators are T. B. Ridgell, W. P. Bailey and M. S. Bailey.

The Cincinnati Dehco Baked Enameling Co. has taken over the business of the Auto Enameling and Painting Co., also of Cincinnati. At the head of this company are L. J. Funke, president, and Cliff Geiss, secretary and treasurer. Charles Hess is superintendent of the plant.

The Himes Motor Sales & Service Co., Lorain, Ohio, has been incorporated with a capital of \$10,000 to buy and sell new and used automobiles, parts and supplies. Incorporators are H. W. Himes, Elva E. Himes, F. J. Racy, A. C. Calhoun and A. W. Glendenning.

The O. T. Schwarz Service Co., Akron, Ohio, has been chartered with an authorized capital of \$10,000 to deal in gasoline, oils and automotive accessories at wholesale and retail. Incorporators are F. R. Ormsby, O. T. Schwartz, J. R. Vaughan, C. K. Kennedy and J. F. Halderman.

The Fisher Ohio Body Co., Cleveland, Ohio, had net earnings for the year that ended April 30, of \$4,600,000 or nearly \$50 a share on 91,350 shares of 8 per cent preferred stock. This compares with \$3,046,215 for 1923. It is a new record for the company. The Ohio Company reported, on April 30, a surplus of \$7,318,531 and out of this back dividends on preferred stock running from April, 1920, to Jan. 30, 1922, and totaling \$1,800,000 were repaid to the parent company, the Fisher Body Corp., which had advanced the money. This with \$755,600 in dividends paid for the year ending April 30 reduced the surplus to \$4,763,931. The Fisher Body Corp. owns about 98 per cent of the common stock of the corporation.

The Excelsior Radio & Auto Supply Co., Milwaukee, has been incorporated with \$12,000 capital stock by Sam Shapiro, Max Weinberg and Jacob S. Rothstein, to deal in electrical supplies, automotive equipment, etc.

Application for charter has been filed by the Ace Auto Painting Co., 4543 W. Lake street, Chicago. Capital \$15,000. To paint, trim and repair automobiles and deal in accessories. Incorporators: H. L. Ackerman, W. J. Templeman, Leo S. Samuels.

The Club Cab Co., 1522 Austin avenue, Chicago, has filed application for charter. Capital \$50,000. Its purpose is to manufacture and operate cabs. Incorporators: James J. Ryan, John W. Piscati, Albert Marks, August Smith, Michael A. Carselle and Frank Stark.

To deal in and repair automobiles and handle accessories and parts is the purpose of the Francis L. Woolley Co., 512 Laurel avenue, Highland Park, Ill., which has filed for a charter. Capital \$20,000. Incorporators: Albert S. Louer, B. Leonard Bird, Francis L. Woolley.

The Landeck Automobile Company has been organized at Freeport Ill., and will have an agency at 24 West Exchange street. The capital stock has been fixed at \$15,000. The company will specialize in machines for garages and will also manufacture tools for such plants. The promoters are H. C. Tagel, G. D. Mills and D. S. Bobb.

The Maryland Accessories Corporation, 825 Equitable Building, Baltimore, has been incorporated by William D. Macmillan, David E. K. Bruce and Joseph T. Brennan to deal in piston rings, etc.

The General Auto Service Company, Inc., 110 McMechen street, Baltimore, has been incorpo-

rated with \$10,000 capital stock to design and construct machines of all kinds. The incorporators are Charles O. Codd, A. E. Sattler, Harry T. Smith and Charles H. Cordner.

Tools, dies, chucks and other mechanical specialties will be made by the newly organized Oneida Chuck Co., Rhineland, Wis., incorporated with \$15,000 capital by Arthur J. Lamotte, E. A. Forbes and R. J. LaSalle, all of Rhineland, in Oneida county, Wis.

The Williamsport Motor Co., Inc., Williamsport, Md., has been incorporated with capital stock of \$25,000 to deal in automobiles, trucks, tractors, etc. The incorporators are Roger O. Charlton, Albert G. Rauth and C. Walter Baker.

The Hartford Piston Service Co., Youngstown, Ohio, has been chartered with an authorized capital of \$25,000 to manufacture, buy, sell and deal in accessories, parts and appliances for motor vehicles. Incorporators are J. W. Kiley, Jas. M. Thomas, E. Thomas, Arthur Morgan, and Ford P. Agey.

The Ashtabula Gasoline & Oil Co., Ashtabula, Ohio, has been chartered with a capital of \$10,000 to buy and sell petroleum products. Incorporators are F. J. Clark, G. W. Butler, C. V. Brown, W. R. Shreve, Victor Korpi and A. R. St. Clair.

The Automotive Construction Co., Akron, Ohio, has been incorporated with a capital of \$10,000 to manufacture, buy, sell and deal in autos, parts and accessories. Incorporators are Harold H. Foltz, George H. Cupples, Ford Darling, William L. DeLeone and Margy J. Miller.

The American Rubber Export Co., Akron, Ohio, has been chartered with an authorized capital of \$10,000 to buy and sell automobile accessories. Incorporators are N. O. Mather, F. G. Kline, L. A. Martin, G. M. Neal and Wendell L. Willkie. Offices will be located in the Metropolitan Building.

Mack Trucks, Inc., has declared the regular quarterly dividends of \$1.50 on the common and \$1.75 on the first and second preferred, all payable June 30 to stock of record June 16.

The Crystal Lake, Ill., Motor Car Company has been organized in that city by H. K. Copenhagen, F. F. Yule and H. C. Calhoun. Capital stock has been fixed at \$25,000. The company will distribute motor cars, trucks and tractors, and also handle a line of accessories and parts.

Goodyear Tire & Rubber Co. has declared the regular quarterly dividend of 2 per cent on the prior preference stock, payable July 1 to holders of record June 20.

Net income of The Kelly-Springfield Motor Truck Co., Springfield, O., from December 16, 1922, to December 31, 1923, totaled \$190,049.26, from total net sales of \$2,046,153.91, according to figures included in special reports of Pearl A. Lewis, receiver, to Common Pleas court. The inventory and appraisal of the company's assets shows real estate and machinery under mortgage at \$571,584.71; other property not included in mortgage \$393,274.36; miscellaneous equipment in branches in other cities \$1,000,228.89. According to Receiver Lewis the company has been enjoying a fair business since the first of the year and prospects are encouraging.

The Ramsey Chain Co., Inc., general office and works, Albany, N. Y., has announced appointment of the Morse Engineering Co., 549 W. Washington street, Chicago, as Chicago representative. This is another step in the extensive sales program recently inaugurated.

Announcement is made at the office of W. H. Jencks, Akron, receiver for the Marathon Tire and Rubber Co., at Cuyahoga Falls, that the receivership, which was to have been terminated last month, has been extended until the end of July at which time creditors and court officials will canvass the situation and make plans for the future. The company was placed in the hands of a receiver on petition of Cleveland and Cuyahoga Falls banks two months ago.

The Penn Motors Corp., 1714 N. Broad street, Philadelphia, has purchased the entire business of the Keystone Motor Truck Corp. of Oaks, Pa., and will carry on all parts business formerly done by the Keystone company, which includes Keystone trucks and Huford and Truxton units. In addition the Penn company will continue with its Penn heavy duty trucks, Pennford trucks and a one-ton commercial car using the standard Overland engine.

fic laws, Assistant Trade Commissioner in Charge Burke cables the Automotive Division. He says that in a recent order traffic in the streets was changed from left to right.

## Truck Industry Not Afflicted With Overproduction Troubles

### Makers of Commercial Vehicles Enjoy Merited Prosperity First Five Months of Year

NEW YORK, June 23.—With production totaling approximately 160,000 for the first five months of the current year, the truck end of the automobile industry is enjoying well merited prosperity, without such a thing as overproduction to worry the manufacturers and with retail sales brisk enough to keep the dealers in a contented frame of mind.

The situation has been brought about, it is declared, because the builders of commercial vehicles did not anticipate a big spring demand and consequently did not overproduce. Therefore, the rainy spell did not affect their retailers as it did their colleagues in the passenger car field and the half way mark will be passed with the truck makers better entrenched in the business field than they ever have been before.

As for car manufacturers, it is more and more apparent that the last half of the year will see production figures lower than those that marked the first part of 1924. The manufacturers, having accumulated a surplus for spring business which did not materialize as expected, now are content to mark time until sales catch up with production. The slow down has not occasioned any embarrassment in the industry and it is felt that a spell of good weather will vindicate their judgment in laying up a surplus for spring demand. Having realized six weeks back that caution in production was necessary because of abnormal conditions, they now are prepared to take conditions as they find them in the next month or so.

It is expected that June, which usually is a bumper month, will be a comparatively slow one in production, for the dealers now have enough cars on hand to meet the summer business demands, while it is believed that the introduction of new models will come earlier than July this year, which, of course, means that those makers bringing them out will taper off 1924 production in order to get ready for the start on 1925's program.

### SIGNING UP DRIVERS

CHARLOTTE, N. C., June 23.—John S. Prince of Oakland, Cal., who has been here preparing to build an automobile agency, is in Altoona this week to sign up drivers for the race which will take place August 16.

The track here will be one and a quarter miles long. The race will be for 200 miles. Two prizes, \$20,000 and \$5,000, will be offered. Track and other building expenses will cost \$300,000. A number of local automobile and other business men are interested in the enterprise and are helping to finance it.

### LEFT-HAND DRIVE

WASHINGTON, June 23.—All automobiles shipped to the Madrid district in Spain should be equipped with left-hand drive, due to the change in the city traf-



## IN THE RETAIL FIELD

The Packard Motor Car Company, of Chicago, plans erection of a sales and service building for its Evanston branch on a site recently purchased from the Hines Lumber Co., at East Railroad avenue and Clark street. The new building will represent an investment of \$125,000. Construction is expected to be completed this fall.

The Lohr Auto Co., Hartford, Wis., an extensive distributor of Ford and Fordson, has announced an association as stockholders of Otto Mickelson, formerly chief engineer and works manager of the Milwaukee engine plant of the Avery Co., Peoria, and his brother, Herman R. Mickelson, secretary and sales manager Wisconsin Motor Mfg. Co., Milwaukee, who will become active in the business with Charles H. Lohr. The concern will incorporate at once. In 1923 it ranked third among Wisconsin dealers in the sale of Ford tractors and equipment, and high in Ford car sales. Three sets of modern buildings comprise the plant erected since 1912 to handle the business.

The Fountain City (Wis.) Garage, Arthur Wolfe, manager, has been appointed Star dealer. The Comerford Motor Car Co., 19 Fourth street, Fond du Lac, Wis., has been appointed Rickenbacker dealer, retaining the Oldsmobile as well.

C. H. Remp has taken over the business of the Sheraden Motor Company, in Sheraden, a Pittsburgh suburb, and has renamed it the Remp Motor Company, with a Ford agency.

W. S. Prejsner, proprietor of the Barrett Garage, in Adams, Mass., has taken the agency for the Oakland.

George Benz of Adams, Mass., has been appointed a sub-dealer for the sale of the Moon, in that town.

The Becker-Whitney Motor Company will specialize in Ford cars and Fordson tractors, with plant and service station at 6148 South Kedzie avenue, Chicago. Capital stock has been fixed at \$15,000. The promoters are Edgar Whitney and Lotar Becker.

The John M. Morris Motor Company of Oak Cliff, a Dallas suburb, is now occupying a new \$100,000 home. It was opened with a big house warming. The Morris company is a Ford and Lincoln dealer.

The Gray Motor Sales Company, located for a number of years at 315 Twenty-fourth street, Rock Island, Ill., has removed its sales agency and service station to 1109 Fifth avenue, Moline, Ill. Claude McCamish and Eric P. Severin are owners of the company and are Gray distributors in the Rock Island county territory. The new quarters are larger and more desirable in many respects than the old.

New H. C. S. dealers: Philbrook Motor Co., Carnegie avenue and Seventieth street, Cleveland, Ohio; National Service & Supply Co., 1636 Connecticut avenue, N. W., Washington, D. C.

A Packard car provided by the Berry Motor Car Co., St. Louis Packard distributor, was used in the production of "Firefly" at the Municipal open air theater recently. It was used in the show for only a short time each evening and was driven by an employee of the Berry Co.

The Diesing Motor Sales Co., St. Louis Rickenbacker distributor, has leased the building at 5143 Delmar boulevard, formerly occupied by the Harry Newman Co., Nash dealer, who recently announced his retirement from the automobile business. The Diesing Co. will maintain its principal establishment at Grand and Washington and will use the Delmar boulevard building as a service plant in charge of Robert Wilson and a West End salesroom in charge of W. J. McGoldrick.

The Hummel Motor Co., 2502 North avenue, Milwaukee, is a new community dealer in the Chrysler Six, and will continue retailing the Overland and Willys-Knight.

Harry C. Stutz, of motor car fame and president of the Stutz Sales Company, with Charles E. Stutz, secretary and treasurer, announce that they have secured the Flint franchise for Indianapolis and the state of Indiana with the exception of eight counties. The Stutz Sales Company formerly handled the Jordan, and more recently the Wills Sainte Claire.

The Flaherty Motor Company, 810 First avenue, Fort Dodge, Iowa, has taken local agency for the Paige and Jewett cars, operating a service station for owners. O. W. Thomas will be associated in the sales department.

New Auburn dealers: John A. Keyes, Caledonia, N. Y.; George N. Durfee, Piffard, N. Y.; Auburn Motor Co., Petersburg, Pa.; Bliss & Myers, 2 Van Franklen avenue, Schenectady, N. Y.; Mack's Garage, Newburgh, N. Y.; Wm. H. Ingerson, 600 W. Genesee street, Syracuse, N. Y.; Schmidt Motor Sales, Ebenezer, N. Y.; Edward J. Walbourn, Sodas, N. Y.; Loghery & Chisholm, Palmyra, N. Y.; William F. Kelley,

Kelley's Garage, Dansville, N. Y.; Emery M. Yoder, Kalona, Iowa; M. Kiefer, Monessen, Pa.

J. S. Harrington, Inc., Hudson-Essex distributor in Springfield, Mass., reports that the present year has given it the largest volume of business it has ever known in a corresponding period and that sales the first part of June were running at the highest level of the year.

The C. H. House Motor Co., Studebaker dealer in Holyoke, Mass., will erect a new showroom in Race street, to cost \$35,000.

R. C. Besaw of the Russell Service Station, Russell, Mass., has been appointed sub-dealer for the Springfield Buick Co.

The Peerless agency in Rochester, N. Y., formerly held by Thomas J. Northway, Inc., has been taken over by Harvey G. Knuth.

W. C. Auble, head of the W. C. Auble Motor Company, 2440 S. Michigan avenue, Chicago, has sold out his controlling interest in the company to Herman J. Rosenberg, who hereafter will serve as Durant and Star distributor in that field. Mr. Rosenberg has been handling the Flint line at 2500 S. Michigan, which agency he retains. Mr. Auble is well known in the local trade, being secretary of the Chicago Automobile Trade Association. It is understood he will make arrangements to remain in the automotive trade.

As part of an employee welfare program being carried out by the Studebaker Sales Company, Chicago, Henry R. Levy, president of the organization, has negotiated for group life insurance for 240 persons connected with the company. The total protection is in the sum of \$400,000. Employees who have been with the company less than one year are insured for \$1,000; those having been with the company more than one year, but less than two, are insured for \$2,000, while all employed for more than two years received certificates for \$3,000. The policies also carry the "total disability" provision, which calls for full payment of the certificate's face in event of total disability.

New Flint dealers: Wonnacott-Eldridge Co., Port Huron, Mich.; Lavoye Motor Co., Lavoye, Wyo.; Harold M. Rice, Derry, N. H.; Antioch Motor Co., Antioch, Cal.; Long-Hurst & Russell Motor Co., Auburn, Cal.; Waldo Anderson & Son, Albany, Ore.; George Heslip Co., Detroit, Mich.

The business of the St. Louis Motor Car Co., Jordan and Kissell distributor in St. Louis, has been taken over by a bank which will liquidate it. John Boe, president of the company, is ill.

The George Cole Motor Co., 1406 Broadway, Nashville, Tenn., has established a separate sales room and service station for handling the Lincoln line.

The Authorized Chevrolet Dealers' Association of Los Angeles has held its annual election of officers. Hayes Eckert was elected president. H. Gwynn vice-president, W. B. Felix secretary-treasurer and A. J. Baldwin and G. Warren directors. There are 14 members of the organization with associate members in a number of the suburban towns. As the result of the association Chevrolet has standardized shop schedules, uniform service rates and co-operative sales plans and advertising.

Three Ford representatives were recent visitors at the offices of The Thompson-Ford agency, Springfield, O. They were George Pool, assistant branch manager, Columbus; C. T. Lathers of Detroit, in charge of the Ford agencies in the Middle West; William Carrol, service manager of the Detroit branch. Mr. Thompson says that his agency has been enjoying a big business this spring and that prospects are bright for a heavy trade this summer. He was formerly located at Buffalo, N. Y.

An increase in the St. Louis District of the Franklin Motor Car Co. has been announced. Formerly the Franklin Motor Car Co. of St. Louis, of which A. E. Spielberg is president, covered only 13 counties surrounding St. Louis, but under the new allotment will have about 100 counties in Eastern Missouri and Southern Illinois. Mr. Spielberg says this will aid dealers in the smaller towns in reducing the investment in parts because of the large supply carried in St. Louis which will enable the small dealer to obtain parts quickly.

The Ford Motor Company of Oklahoma City, Okla., has secured a permit for the erection of a brick business building at 922 to 930 West Main street, at a cost of \$120,000.

The Tate Motor Car Co., St. Louis Dodge distributors, has announced that other dealers in outlying districts of the county will be established in the near future.

The Ford-Nelson Motor Co. of Ogden, Utah, has just erected an addition to its building which will be used for a show room. This firm has recently taken on the Rickenbacker agency.

## American Tire Makers Slip In Fight for Foreign Markets

### Figures on Exports as Analyzed by Shipping Managers Continue to Show Decrease

AKRON, O., June 23.—Figures on the export of tires as analyzed by export managers here continue to show decreases and indicate that American manufacturers are at least temporarily losing in the fight against revived foreign competition.

During the first months of the present year exports of tires amounted to only \$4,466,304, as compared with \$7,642,750 for the same period last year. During April they amounted to \$1,402,594, as compared with \$1,714,700 during April of 1923 and \$1,910,103 during March of this year.

Imports into England now are slightly more than one-third of those during the first four months of 1923. For the year thus far they amount to \$552,000 as compared with \$1,413,000 imported during the corresponding period last year.

In some of the British colonies, where American tires have been decreasing in popularity, the April imports showed improvement although in most instances the year's imports are still far below those of previous years.

Canada has imported thus far \$132,474 worth of tires, as against \$293,922 imported during the first four months of 1923; New Zealand, \$167,372, against \$465,379 imported during the first four months of 1923, and South Africa, \$141,317, against \$302,007.

Japan has taken \$379,577 worth of tires as against \$194,734 imported during the first third of last year. The passage of the Japanese exclusion act will doubtless have a marked effect upon the Japanese exports during the remainder of the year.

Mexico, after showing declines is now about equal with last year's total thus far this year, being \$287,935 against \$288,660.

### ROUMANIAN REGISTRATION

WASHINGTON, June 19.—Total registrations of automobiles in Roumania on January 1, 1924, have just been estimated at 10,300, of which 7,500 are passenger cars, 2,250 motor trucks and camions and 550 motor cycles, the Automotive Division is informed. Rumania has no factories for the manufacture of motor vehicles, and the entire number needed there must be imported.

### LEXINGTON FIRST ENTRY

DENVER, June 23.—The first factory entry for the sixth annual and final Pike's Peak national hill climb for the Penrose trophy which will be held Labor Day has been made by the Lexington Motor Co. of Connersville, Ind. Ott Loesche, who drove the Lexington to victory in the 1920 climb, will have the mount.

## CONCERNING MEN YOU KNOW

Mason Towle, president of the Mason Towle Company, Cincinnati, Dodge distributors in Cincinnati territory, has been endorsed for County Commissioner on the Republican ticket by the Republican organization in Cincinnati. Mr. Towle has been in the automobile business in Cincinnati for the past 16 years.

H. M. Carroll has been appointed manager of the Dayton office of Campbell-Ewald Co. For the past three years Mr. Carroll has been advertising manager of the Remy Electric Co., and previous to that held a similar position with the tractor and implement bearings division of the Hyatt Roller Bearing Co. G. C. Jefferson, at one time assistant advertising manager of Earl Motors, Inc., has become a member of the Detroit organization of the Campbell-Ewald Co.

J. C. Merwin, works manager of the Chain Belt Co., of Milwaukee, has been elected second vice-president, while other changes made at the annual meeting included the election of Brinton Welser as secretary and C. E. Stone as assistant secretary. The latter is assistant to the president and has also been purchasing agent since 1918. Officers reelected were: C. R. Messinger, president; Clifford F. Messinger, first vice-president, and C. L. Pfeifer, treasurer.

Following the retirement of G. W. McLaughlin as vice-president and general sales manager of General Motors of Canada, J. H. Beaton has been appointed general sales manager and C. E. McTavish general parts and service manager. K. T. Keller, formerly manager of production of the Chevrolet Motor Co., who some time since was made general manager of General Motors of Canada, has been appointed vice-president, reporting to R. S. McLaughlin, president.

A. H. Dewees, formerly assistant purchasing manager of the Packard Motor Car Co. and purchasing manager of the Saxon Motor Corp., and who for the past few years has been identified with the United States Asbestos Co. in the East, has opened offices in the Free Press Building, Detroit, and the Swetland Building, Cleveland, for the handling of brake lining and other products of the United States Asbestos Co.

Earl Winne formerly connected with Sargeant-Baker, Inc., Oakland distributors in Rochester, N. Y., has been appointed sales manager of Darling, Norton and Mack Auburn and Gardner distributors in Rochester.

E. H. Shepard has resigned his position as general sales manager of the Holley Carburetor Company. Mr. Shepard is well known throughout the automotive industry, having been connected with the manufacture and sale of carburetors for more than 14 years. His future plans have not been announced.

Gaston Plaintiff, Eastern manager of the Ford Motor Co., made a speech presenting on behalf of Mr. Ford the new museum building in Belchertown, Mass., which is to house relics of the carriage industry in that section, dedication of which took place June 5.

George L. Willman, for the past four years vice-president and general sales manager of the John G. Wollaeger Co., 2729 Grand avenue, Milwaukee, distributor of the Studebaker, resigned June 1 to become associated with Lord & Thomas, Chicago. In his new connection Mr. Willman will have complete charge of the Studebaker advertising account. He was associated with the Studebaker factory sales executive department prior to joining the Wollaeger Company at Milwaukee.

Jesse A. Smith, president of the Jesse A. Smith Auto Co., distributor of the Hudson and Essex at Milwaukee, is one of the principals in the organization of a new national bank with \$200,000 capital and \$50,000 surplus, for which application for a government charter has just been made. The proposed bank is to occupy part of the new \$2,000,000 Wisconsin Theater Building at Grand avenue and Sixth street, and is financed largely by business men in the immediate vicinity.

Kenneth C. Plasterer, formerly works manager, and W. C. Buser, formerly service manager and assistant director of sales of the Midwest Engine Co., Indianapolis, have joined the staff of the Stoughton Wagon Co., Stoughton, Wis., manufacturer of motor trucks and buses. The Stoughton Company used Midwest engines and when the Indianapolis business was sold recently, acquired tools and manufacturing rights to three types of the Midwest design, together with materials and parts for about 200 engines.

H. N. Tolles, Sheldon school of efficiency, Chicago, addressed 100 auto dealers and salesmen at a recent meeting arranged by the Bloomington (Ill.) Automotive Trade Association. A dinner preceded the program.

C. E. "Buzz" Graves, secretary and manager of the Lambert-Graves Motor Co., Inc., Ford and Lincoln dealer, St. Louis, will make an inspection of Ford and Lincoln establishments in ten

of the leading cities of the United States to obtain modern ideas for the new building which his company is to erect soon.

The \$1,000 prize offered by "Field and Stream" magazine for the most effective advertising built on an out-of-doors appeal, published in a national periodical during 1923 has just been awarded to Edward S. Jordan, president of the Jordan Motor Car Company.

The University of Notre Dame at its commencement exercises conferred the honorary degree of Doctor of Laws upon A. R. Erskine, president of the Studebaker Corporation. Mr. Erskine has for the past three years been president of the Board of Lay Trustees of the University.

M. E. Bushong has been appointed manager of the Philadelphia branch of the Oakland Motor Car Company to fill the vacancy caused by the recent death of Charles E. Wells. Mr. Wells served as manager of this branch for the last six years, after holding a similar position with the Oakland Company at Omaha, Nebr. Mr. Bushong has been branch manager of Oakland at Pittsburg and has been with the Oakland Company seven years. C. A. Rehtmeyer, who has been assistant branch manager at Chicago, will take Mr. Bushong's place at Pittsburg.

The Cincinnati Flint Company, 1002 Gilbert avenue, factory branch of the Flint Motor Company, Flint, Mich., announced appointment of C. L. Kelsey as director of retail sales. Mr. Kelsey is very well known in automobile circles in the Queen City as he was for a number of years district manager for the B. F. Goodrich Company and recently was associated with the Studebaker organization as personal representative for Mr. E. S. Gahagen.

E. H. Shepard has resigned as general sales manager of the Holley Carburetor Co. and has not announced his plans for future activity. He is well known in the industry and has been connected with the manufacture and sale of carburetors for more than 14 years.

I. G. McNiece, president, and Ernest J. Krause, Jr., vice-president of the McNiece Motor Co., St. Louis distributors of the Wills St. Claire and Moon dealer, were on the Wabash train which was wrecked at Williamsport, Ind., June 1, with the loss of eleven lives. Mr. McNiece and Mr. Krause boarded the train at St. Louis and were placed in the Toledo car which was flooded with steam at the time of the accident, but at Decatur, Ill., half hour before the collision, they were placed in the Detroit car. All the passengers in the Detroit car escaped injury while those in the Toledo car suffered injury and death. Both Mr. Krause and Mr. McNiece aided in the rescue work.

A. G. Abraham has been named president of Mineral Rubber Products Co., Moline, Ill., and A. E. Montgomery vice-president. Beder Wood is secretary.

President B. J. Westcott of the Westcott Motor Car Co., Springfield, Ohio, has resigned as treasurer of the American Seeding Machine Co., so he can give all his time to the business of the motor car company. The resignation is effective June 30. Mr. Westcott says the Westcott company has prospects for considerable foreign business. Douglas Andrews, director of sales, who is making a trip through the East, has notified headquarters that prospects are bright for sales in that section.

Recognizing the fact that the automobile industry is dependent, to a large extent, upon the condition of the highways, Frank Robins, distributor in Havana, Cuba, for the Nordyke & Marmon Company has taken part in the "Good Roads" movement which has been started recently in Cuba. Mr. Robins is one of the largest automobile distributors on the island. Touring in Cuba, as it is practiced in the United States, is practically impossible because of the almost impassable condition of the roads. Mr. Robins says motorists find it impossible to make long trips by automobile and they are denied, to a large extent, all of the more delightful features of motoring. Mr. Robins recently visited the factory of the Nordyke & Marmon Company in Indianapolis and painted a glowing picture of the future for the automobile industry on the island.

Floyd W. Adams has been engaged as special factory representative by the Biflex Products Co., Waukegan, Ill., manufacturers of Biflex Cushion Bumpers. For the past six years Mr. Adams has been connected with the Victor Mfg. & Gasket Co., Chicago, in a similar capacity, selling gaskets as original equipment to the automotive trade throughout the states of Michigan, Indiana, Ohio, New York and Pennsylvania.

J. Morris Jones has been appointed assistant manager of the retail sales department of the Leyman-Buick Co., Cincinnati. Mr. Jones was formerly sales manager of the Cincinnati Flint Co.

## G. M. C. Sales to Consumers For Five Months Hit 320,906

### Drop Less Than 4 Per Cent as Compared with Corresponding Period 1923

NEW YORK, June 23.—Actual delivery of General Motors cars and trucks to consumers in the first five months of this year totaled 320,906, compared with 333,938 in the corresponding period of 1923, a drop of less than 4 per cent.

In making this announcement, President A. P. Sloan, Jr., of the General Motors Corp. differentiates between sales of cars to dealers and deliveries of cars by dealers to consumers. This is a prelude to a statement by the head of General Motors that hereafter there also will be issued monthly reports on cars delivered to consumers. In his statement, he says:

"I have recently noted various articles in the press dealing with the reduction in activity in the motor car industry and citing current production figures as an indication of such a trend. While production is at present below the level of the past winter and early spring months, due to the policy of reducing dealers' stocks, it should be recognized that the real index is the rate of deliveries by dealers to the consumer. Obviously production must sooner or later be adjusted to that trend.

"Heretofore, it has been the custom of General Motors to publish only figures of sales of cars to dealers. In order, however, to permit a more adequate analysis of the situation General Motors will in the future issue monthly figures showing both sales to dealers as well as deliveries of cars to the consumer."

### PRODUCE RADIATOR SHIELD

DETROIT, June 23.—The Parsons Manufacturing Co., in addition to its regular line of equipment, which it sells direct to car and body manufacturers, is soon to bring out a radiator shield, which it will sell as equipment and also to the car owner. In selling to the replacement field the company is planning to sell direct through jobbers, and to supplement the merchandising effort by the jobber with direct factory representatives in the retail field.

### MOVE HEADQUARTERS

DETROIT, June 23.—The St. Louis headquarters of United Motors Service has been removed from 312 North Leonard street to the Haas building, Locust street and Jefferson avenue. The new quarters are located in the automobile section close to street car and bus lines.

### BUY BUS COMPANY

DECATUR, Ill., June 23.—The Illinois Power & Light Co. has purchased the Decatur Bus Co., it was announced at a joint meeting with Decatur officials.



# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Chicago.....Jan. 24-31, 1925.....National Automobile Chamber of Commerce.

Detroit .....Jan. 17-24, 1925.....Detroit Automobile Show, Detroit Dealers' Assn.

Green Bay, Wis.....Aug. 25-30.....Automotive Division, Association of Commerce, W. F. Kerwin, Manager.

Kansas City, Mo.....Feb. 7-14, 1925.....Kansas City Motor Car Dealers' Association Show.

Milwaukee, Wis.....Aug. 25-30.....Milwaukee Automotive Dealers' Association, Fall Show, Bart L. Ruddle, Manager.

New York.....Jan. 3-10, 1925.....National Automobile Chamber of Commerce.

Reno, Nev.....June 14-21.....Annual State Exposition under auspices of Reno Motor Car Dealers' Assn.

Sacramento, Cal.....Sept. 1-10.....State Agricultural Society, C. E. Paine, Manager.

Toronto, Ont.....Aug. 23-Sept. 6.....Canadian Automotive Equipment Association and the Automotive Industries of Canada, Gib Robertson, Secretary.

## FOREIGN SHOWS

London, Eng.....Oct. 16-25

Paris, France.....Oct. 2-12.....Passenger Car and Accessory Show

## CONVENTIONS

Detroit, Mich.....Oct. 22-24.....S. A. E. Production Meeting and Exhibition.

Selma, Ala.....July 21-22.....Midsummer meeting Alabama Automotive Traders' Association.

New York City.....Jan. 7, 1925.....New York Show, Convention N. A. D. A.; Hotel Commodore.

Chicago.....Jan. 26-29, 1925.....Eighth Annual Convention, N. A. D. A., Hotel La Salle.

## RACES

July 4.....Abilene, Tex.....West Texas Fair.....Short Races

June 14.....Altoona, Pa.....Altoona Speedway Assn. 250 Miles

Sept. 1.....Altoona, Pa.....Altoona Speedway Assn. 250 Miles

Sept. 1.....Colorado Springs, Colo.....Pikes Peak Highway.....12½ Miles

Oct. 4.....Fresno, Cal.....Fresno Speedway Assn. 150 Miles

July 4.....Kansas City, Mo.....K. C. Speedway Assn. 250 Miles

Oct. 19.....Kansas City, Mo.....K. C. Speedway Assn. 250 Miles

Nov. 29.....Los Angeles, Cal.....L. A. Speedway Assn. 250 Miles

Sept. 7.....Monza Track, Milan Italy.....Italian Grand Prix

Sept. 13.....Syracuse, N. Y.....Horace P. Murphy.....100 Miles

## Comings to Succeed Adair as Motor World Editor; Beecroft to Assume Editorial Charge of Automobile Trade Journal

Neal G. Adair, who has been editor of Motor World for the past four years, has resigned from that position to take effect July 1, and will join the staff of the Motor and Accessory Manufacturers Association on that date. Mr. Adair will be succeeded as editor of Motor World by A. V. Comings, who comes to this position from Automobile Trade Journal, of which he was managing editor. Previous to assuming this latter position, Mr. Comings was for six years its staff field editor and during that time traveled almost continuously, visiting repeatedly every section of the United States. He has a wide acquaintance with men throughout the industry and the trade generally, and his personal contact with conditions from coast to coast and border to border fit him admirably for the editorial direction of Motor World.

Mr. Comings will be succeeded as editor of Automobile Trade Journal by David Beecroft, who will continue his office as chairman of the advisory committee of the Class Journal and Chilton

companies. Mr. Beecroft's activities during his long association with the industry have embraced a close association with every phase of its development and his intimate acquaintance with the men who manufacture and distribute automotive products is second to none. Automobile Trade Journal is fortunate in securing a man of Mr. Beecroft's unusual ability to direct its editorial management.

Mr. Adair in his new work will take up the management of the show department and the educational and publicity activities of the Motor and Accessory Manufacturers Association. It is with sincere regret that Mr. Adair's retirement is accepted in the Class Journal office. He brought to his work with Motor World a particularly engaging personality and a breadth of experience in the newspaper field that won the admiration and the intimate friendship of hosts of automotive men throughout the country. He has the unqualified good wishes of his co-workers and friends in the industry for his entire success in his new position.

## Dealer Sales in Cleveland Hit Better Stride Than in May

CLEVELAND, June 23.—Sales of automobiles in the Cleveland territory are better this month than they were in May. The record for the first half of the month, however, is below the figure for the same period last year.

Sales of used cars are being made at a better rate than are new cars.

The weather has been more favorable this month than it was in May and that has helped considerably.

The announcement by all the big tire companies having branches in this city that they would give away wheels and rims with each purchase of five full balloon tires has had a stimulating effect on sales of that class of tires.

The automobile finance companies report that purchasers are keeping up their payments, and that dealers are not embarrassed to any extent on account of cars being turned back. One of the big finance companies in the city that had 50 to 60 cars turned back every month during November, December and January now averages but two a month. The warmer weather influences all owners to hang on to their cars.





## Prices and Weights of Current Passenger Car Models

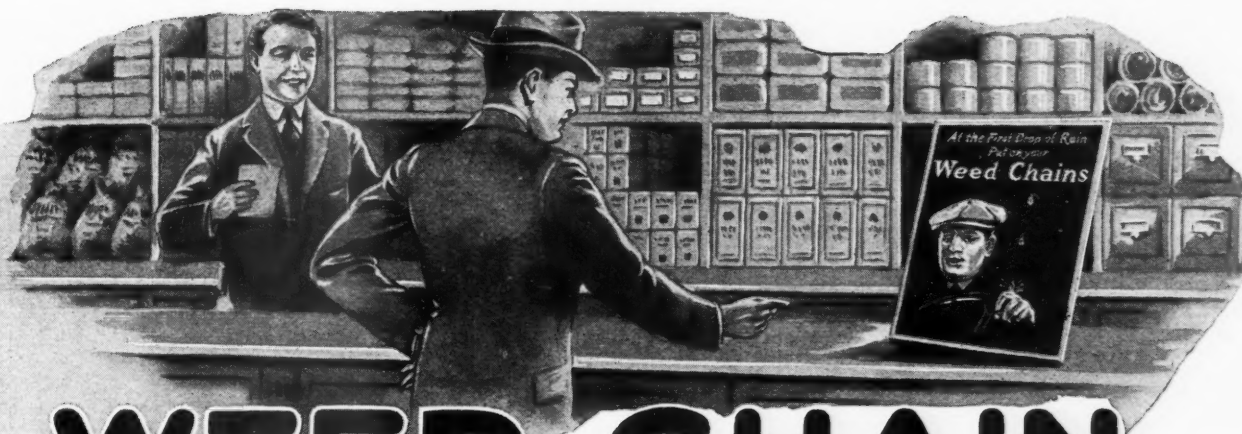
Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price
LINCOLN					OAKLAND					REVERE					STEVENS-DURYEA				
4050	2-p		Roadster	\$3,800	2420	3-p		Roadster	\$995	3700	2-p		Roadster	\$3,200	4200	2-p		Roadster	\$3,150
4290	7-p		Touring	3,800	2510	3-p		Sp. Roadster	1,095	3500	4-p		Speedster	3,200	4400	7-p		Touring	7,500
4215	4-p		Phaeton	3,800	2485	5-p		Touring	995	3800	5-p		Touring	3,200	4250	4-p		Sp. Touring	7,750
4380	5-p		Coupe	4,400	2550	5-p		Sp. Touring	1,095	4300	5-p		Sedan	4,000	4600	4-p		Coupe	9,000
4315	4-p		Sedan	4,600	2620	3-p		Coupe	1,195					4600	4-p		Sedan	10,000	
4600	5-p		Sedan	4,700	2720	4-p		Coupe	1,395					4800	6-p		Sedan	9,675	
4650	7-p		Sedan	4,900	2860	5-p		Sedan	1,445					4800	6-p		Town Brougham	10,175	
4720	7-p		Limousine	5,100										4800	6-p		Vestibule Limou.	9,675	
LOCOMOBILE					OLDSMOBILE					RICKENBACKER					4800 7-p Vestibule Limou. 10,175				
"48"					"30"					"M"					4800 7-p 1/2 Limousine 10,175				
5225	4-p		Sportif Tour.	\$7,400	2145	2-p		Roadster	\$785	2815	3-p		Sp. Roadster	\$1,645	4800 7-p Cabriolet 10,175				
5525	7-p		Touring	7,400	2270	2-p		Roadster	885	2880	5-p		Sp. Touring	1,595					
5525	5-p		Victoria Sedan	9,990	2170	5-p		Touring	795	3050	4-p		Coupe	2,095					
5425	7-p		Brougham	9,990	2320	5-p		Sp. Touring	915	3160	5-p		Sedan	2,195					
5480	7-p		Tour. Limousine	9,000	2295	2-p		Cab	985	ROAMER					STUDEBAKER				
5460	7-p		Encl. Drive Lim.	9,990	2410	4-p		Coupe	1,075	"6-54-E" (118 in. W. B.)					Light Six "EM"				
5722	7-p		Cabriolet	10,250	2570	5-p		Sedan	1,135	3100	2-p		Roadster	\$2,685	2510	3-p		Roadster	\$1,025
McFARLAN					2700	5-p		Sp. Sedan	1,245	3100	4-p		Tour	2,485	2650	5-p		Touring	1,045
"6" TV					OVERLAND					"6-54-E" (138 in. W. B.)					2650 5-p Coupe 1,195				
"Light 6" 8V					"91" (100 in. W. B.)					"4-75-E"					2955 5-p Coupe 1,395				
4600	2-p		Roadster	\$5,400	1844	2-p		Roadster	\$495	4100	5-p		Spec. Sedan	4,250	3030	5-p		Sedan	1,485
4600	4-p		Sport Touring	5,600	1910	5-p		Touring	495	4200	7-p		Suburban-Sedan	3,950	Special Six "EL"				
4700	7-p		Touring	5,700	2100	2-p		Coupe	650	"4-85-E"					3065 2-p Roadster 1,400				
4900	4-p		Coupe	6,720	2200	5-p		Sedan	795	3650	4-p		Sport	3,650	3305	5-p		Touring	1,425
5200	4-p		Tour. Sedan	6,720	2053	5-p		Coupe Sedan	655	"4-85-E"					3650 5-p Coupe 1,985				
5200	7-p		Tour. Sedan	6,810				"92" (106 in. W. B.)		3200	2-p		Spec. Speedster	3,785	3650	5-p		Sedan	1,985
5200	7-p		Sp. Sedan	6,600	2047	5-p		Red Bird	695	ROLLIN					Big Six "EK"				
5200	7-p		Sub. Sedan	7,000				Blue Bird	725	2300	5-p		Touring	\$995	3745	5-p		Speedster	1,835
5100	7-p		Limousine	6,900	PACKARD					"H"					3630 7-p Touring 1,750				
5200	7-p		Town Car	9,000	"6" (126 in. W. B.)					3840 4-p Sp. Roadster \$2,400					3770 5-p Coupe 2,495				
					3165	4-p		Roadster	\$2,785	3850 5-p Touring 2,300					4130 7-p Sedan 2,685				
					3320	5-p		Touring	2,585	4050 5-p Coupe 3,000					STUTZ				
					3255	4-p		Sp. Touring	2,750	4160 5-p Club Sedan 3,050					3600 Roadster \$2,765				
					3425	5-p		Per. Top. Touring	2,850	4165 7-p Sedan 3,250					3950 5-p Sportster 2,790				
					3400	4-p		Coupe	3,275	ROLLS-ROYCE					4100 7-p Touring 2,640				
					3515	5-p		Coupe	3,450	4750 2-p Roadster \$11,400					4050 4-p Bull Dog 3,115				
					3565	5-p		Sedan	3,375	5000 7-p Touring 11,450					3700 3-p Bear Cat 2,765				
					3610	5-p		Sedan Limousine	3,425	4900 5-p Phaeton 10,900					4200 4-p Sp. Coupe 2,990				
					3430	7-p		Touring	2,785	5385 7-p Sedan 12,900					4300 4-p Sp. Coupe 3,250				
					3690	7-p		Sedan	3,625	5400 7-p Limousine 12,850					3250 2-p Roadster 1,995				
					3765	7-p		Sedan Limousine	3,675	5100 5-p Cabriolet 12,800					3450 5-p Tourabout 2,265				
								"8" (136 in. W. B.)		5300 5-p Salamanca Cab. 13,500					3350 5-p Phaeton 1,995				
					3880	4-p		Runabout	3,850	SENECA					3750 5-p Sedan 2,550				
					3990	5-p		Touring	3,650	50 & 51 C					3900 5-p Sportster 2,650				
					3930	4-p		Sp. Touring	3,800	2500 2-p Roadster \$985					3950 7-p Tourster 2,685				
					4125	4-p		Coupe	4,550	2500 5-p Touring 985					4150 5-p Brougham 3,350				
					4200	5-p		Coupe	4,725	STANLEY					4350 7-p Suburban 3,500				
					4270	5-p		Sedan	4,650	"740"					4450 7-p Berline 3,600				
					4275	5-p		Sedan Limousine	4,700	5-p Phaeton \$2,750					TEMPLAR				
					4020	7-p		Touring	3,850	7-p Phaeton 2,750					3300 4-p Suburban Tour. \$2,175				
					4275	7-p		Sedan	4,900	5-p Sedan 3,585					3300 5-p Phaeton 1,985				
					4350	7-p		Sedan Limousine	4,950	7-p Sedan 3,985					5-p Sedan 2,785				
					PAIGE					STAR					6-p Brougham 2,650				
					3677	4-p		Phaeton	\$1,795	1700 2-p Roadster \$540					VELIE				
					3742	7-p		Phaeton	1,795	1735 5-p Touring 540					2780 5-p Touring 1,275				
					3880	4-p		Phaeton DeLuxe	1,995	1800 5-p Spec. Touring 640					2780 5-p Sp. Touring 1,275				
					4040	5-p		Sedan	2,595	1925 2-p Coupe 695					2990 5-p Silver Swallow 1,665				
					4128	7-p		Sedan	2,595	2025 5-p Sedan 785					2895 5-p DeLuxe Touring 1,495				
					4300	7-p		Sub. Limousine	2,895	2100 5-p Spec. Sedan 935					2970 4-p Coupe 1,845				
					4100	5-p		Sedan DeLuxe	2,770	STEARNS-KNIGHT					3110 5-p Royal Sedan 1,845				
					3900	5-p		Brougham 4 d.	2,175	"4"					3110 5-p Sedan 1,895				
					4285	7-p		Sedan DeLuxe	2,770	4-p Coupe Roadster \$1,795					3300 5-p Touring Sedan 2,095				
					PEERLESS					3775 5-p Touring 1,595					1945 5-p Brougham 4 d. 1,945				
					3200	2-p		Roadster	\$2,185	4250 5-p Sedan 2,095					WESTCOTT				
					3325	4-p		Touring	2,185	3750 4-p Coupe Brougham 1,895					"44"				
					3675	5-p		Sedan	2,875	5-p Brougham 2,095					3050 5-p Touring \$1,690				
								"8"-66		STEPHENS					3150 5-p Spec. Touring 1,840				
					3980	7-p		Tour. Phaeton	2,690	104 & 20 (117 in. W. B.)					3300 5-p Brougham 4 d. 2,290				
					4300	5-p		Sedan	3,690	2875 Roadster \$1,295					3550 7-p Touring 1,990				
					4355	7-p		Sedan	3,840	2975 Touring 1,295					3650 7-p Spec. Touring 2,190				
					4120	4-p		Victoria Coupe	3,390	3890 Sedan 1,995					3300 5-p Sedan 2,190				
					PIERCE-ARROW					3180 Touring Sedan 1,595					WILLS-SAINTE CLAIRE				
					4350	2-p		Runabout	\$5,250	3300 Touring 1,595					"48"				
					4590	5-p		Touring	5,250	3300 Poursome 1,750					3550 7-p Touring 1,990				
					4780	3-p		Coupe	6,800	3675 Sedan 2,550					3650 5-p Imperial Sedan 3,375				
					4830	4-p		Sedan	6,900	STERLING-KNIGHT					3500 5-p Brougham 3,375				
					4960	7-p		Sedan	7,000	3200 4-p Sp. Touring \$2,250					3650 5-p Limousine 3,850				
					4750	4-p		Coupe Sedan	6,900	3235 5-p Phaeton 2,150					3600 5-p Town Car 3,850				
					4730	6-p		Brougham	6,800	3450 5-p Sedan 2,800					"B-68" (127 in. W. B.)				
					4850	7-p		Limousine	7,000	3450 4-p Sp. Brougham 2,750					4-p Roadster 2,875				
					5060	7-p		Enclosed Lim.	7,000						3490 5-p Gray Goose Spec. 2,675				
					4780	7-p		French Lim.	7,000						3470 7-p Touring 2,675				
					4732	6-p		Landaulet	7,000						5-p Gray Goose 2,875				
					PREMIER										3575 7-p Phaeton 2,875				
					3710	2-p		Roadster	\$2,885						3515 4-p Coupe 3,875				
					3870	5-p		Open-Touring	2,885						3650 5-p Sedan 3,775				
					3920	7-p		Touring	2,935						3465 5-p Brougham 3,800				
					3910	5-p		Sp. Touring	2,985						3675 7-p Limousine 3,990				
					4320	7-p		Sedan	4,175						WILLYS-KNIGHT				
					4185	5-p		Brougham	4,175						"64"				
					REO										2700 2-p Roadster \$1,175				
					3195	5-p		Sta. Touring	\$1,395						2790 5-p Touring 1,195				
					3225	5-p		Sport Touring	1,595						3106 5-p Country Club 1,635				
					3320	4-p		Coupe	1,875						3126 5-p Sedan 1,695				
					3490	5-p		Sedan	1,985						3100 4-p Coupe Sedan 1,450				
					3655	5-p		Brougham 4 d.	2,235						3126 5-p Sedan DeLuxe 1,895				
					"T-6"										"67"				
					3195	5-p		Sta. Touring	\$1,395						2934 7-p Touring 1,325				
					3225	5-p		Sport Touring	1,595						5-p Coupe Sedan 1,550				
					3320	4-p		Coupe	1,875						3300 7-p Sedan 1,990				
					3490	5-p		Sedan	1,985										
					3655	5-p		Brougham 4 d.	2,235										

## Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL		TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES			Steering Gear	Rear Springs
		Wheelbase (Ins.)	Standard Size (Ins.)	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make	Make	Type and Make	Type and Make	Gear Ratio	Foot, Type and Location	Hand, Type and Location	Four Wheel Brake Type	Make	Type and Length
American.....D-66	127	33x4 1/2	No	H-Sp	91	6-3 1/2 x 5	29.40	L	C	3	PS	Str	A-K	G-D	P-B&B	War	M-Har	F-Sal	5.10	E-R	I-R	None	Lav	S-57 1/2	
Anderson.....41	115	32x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Zen	Wes	Wes	P-B&B	Dur	F-Thi	1/2 Sal	4.75	E-R	E-T	Mec*	Gem	S-58	
Anderson.....50	122	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Zen	Rem	Rem	P-B&B	Dur	F-Uhi	1/2 Sal	4.62	E-R	E-T	Mec*	Gem	S-58	
Apperson.....6	120	32x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.44	L	C	3	PS	Str	Rem	Rem	P-Roc	Mec	M-Thi	1/2 Col	5.10	E-R	I-R	Mec*	Lav	J-48	
Apperson.....8	130	33x5	No	Own	8	8-3 1/2 x 5	33.80	L	C	3	FP	Joh	Rem	Rem	Bij	D-Own	M-Thi	1/2 Own	4.25	E-R	I-R	Mec*	Own	J-48	
Auburn.....6-43	114	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Rem	Rem	P-B&B	War	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57	
Auburn.....6-63	122	32x4 1/2	Yes*	Weid	Spec	6-3 1/2 x 5	25.35	I	C	3	PC	Str	Rem	Rem	P-B&B	War	M-Thi	1/2 Col	4.63	E-R	E-T	Mec*	Ros	S-57	
Barley.....6-50	118	32x4	No	H-Sp	40	6-3 1/2 x 5	25.35	L	C	4	PC	Str	Del	Del	P-B&B	Ful	R-M&E	1/2 Col	5.10	E-F	I-R	Hyd	Jac	S-56	
Buick.....4	109	31x4	No	Own	4	4-3 3/4 x 1 3/4	18.23	I	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.66	E-F	I-R	Mec	Jac	S-55 1/2	
Buick.....6	120	32x4	No	Own	6	6-3 3/4 x 4 3/4	27.34	I	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.10	E-F	I-R	Mec	Jac	V-46 1/2	
Buick.....128	128	32x4 1/2	No	Own	6	6-3 3/4 x 4 3/4	27.34	I	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	1/2 Own	4.70	E-F	I-R	Mec	Jac	V-46 1/2	
Cadillac.....V-63	132	33x5	No	Own	63	8-3 1/2 x 5 1/2	31.25	L	C	3	PC	Own	Del	Del	D-Own	Own	M-Spi	F-Own	4.50	B-F	I-R	Mec	Own	N-54	
Case.....X	122	32x4 1/2	No	Own	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	None	Jac	S-53	
Case.....Y	132	33x5	No	Cont	6T	6-3 1/2 x 5	33.75	L	A	3	PC	Ray	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.40	E-R	I-R	None	Jac	S-57	
Chalmers.....Y	117	32x4	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gem	S-56	
Chalmers.....Y	122	33x4 1/2	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gem	S-56	
Chandler.....SS	123	32x4	Yes	Own	6	6-3 1/2 x 5	29.40	L	C	4	PC	Sch	Bos	Bos	P-B&B	Own	Own	F-Own	4.45	E-R	E-T	Mec*	Own	S-57	
Chevrolet.....Superior	103	30x3 1/2	No	Own	6	4-3 1/4 x 4	21.76	I	C	3	PS	(Zen/Hol)	Rem	(Rem/A-L)	K-Own	Own	M-Own	1/2 Own	3.77	E-R	I-R	None	Own	Q-28	
Chrysler.....Six	112 3/4	29x4 1/2	Yes	Own	6	6-3 x 4 3/4	21.60	L	A	7	FP	Str	Rem	Rem	D-Own	Own	M-Own	1/2 Own	4.60	E-F	E-T	Hyd	Jax	S-51 1/2	
Cleveland.....42	115	31x5 1/4	Yes	Own	42	6-3 1/2 x 4 3/4	22.50	L	C	3	PC	Str	Bos	Bos	P-B&B	Own	R-Mec	1/2 Own	4.90	E-R	E-T	Mec	CAS	S-53	
Cole.....Master	127 1/4	33x5	Yes*	Nort	311	8-3 1/2 x 4 1/2	39.20	L	A	3	PC	Joh	Del	Del	D-Nor	Nor	M-Spi	F-Col	4.70	E-R	I-R	None	Gem	S-57	
Columbia.....115	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	Dur	M-Spi	1/2 Tim	4.80	E-R	E-T	Hyd*	Gem	S-56	
Crawford.....6-70	138	33x4 1/2	No	Cont	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	S-58	
Cunningham.....V4	132	33x5	No	Own	V4	8-3 3/4 x 5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	R-Sne	F-Tim	4.23	E-R	I-R	None	Gem	J-62	
Cunningham.....V4	132	33x5	No	Own	V4	8-3 3/4 x 5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	R-Sne	F-Tim	4.23	E-R	I-R	None	Gem	J-62	
Dagmar.....6-70	138	33x5	No	Cont	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	S-58	
Daniels.....23-38	132	33x5	No	Own	23-38	8-3 1/2 x 5 1/2	38.20	...	C	...	PC	Zen	Del	Del	P-Own	Own	M-Spi	F-Tim	4.23	E-R	I-R	None	Gem	.....	
Davis.....71	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-52	
Davis.....81	118	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-52	
Dodge Brothers.....116	116	32x4	Yes*	Own	4	4-3 3/4 x 1 3/4	24.03	L	A	3	PS	Ste	N-E	N-E	D-Own	Own	M-Own	1/2 Own	4.54	E-R	I-R	None	Own	S-55	
Dort.....27	115	31x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.41	I	C	3	PC	Car	Bos	Bos	D-Dil	Own	M-The	1/2 Fli	4.66	E-R	I-R	None	Gem	V-50	
Duesenberg Straight.....8	134	33x5	No	Own	8	8-2 1/2 x 5	26.45	I	A	3	PC	Str	Del	Del	P-Own	Own	R-Cl	1/2 Own	4.90	I-F	E-T	Hyd	Lav	S-59	
Dupont.....C	124	32x4 1/2	No	H-Sp	90	6-3 1/2 x 5	29.40	L	C	3	PS	Str	Wes	Wes	D-B-L	B-L	M-Spi	F-Col	4.45	E-R	I-R	None	Jac	S-58	
Durant.....A-22	109	31x4	Yes*	Cont	Spec	4-3 3/4 x 4 1/4	24.03	I	C	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	1/2 Ad	4.33	E-R	I-R	Mec*	War	S-48	
Elcar.....6-41	112	31x4	No	Lyc	CF	4-3 3/4 x 5	21.03	L	A	5	PC	Zen	Del	Del	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	S-51	
Elcar.....6-51	113	31x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51	
Elcar.....6-61	118	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Har	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	S-52	
Elgin.....25	118	32x4 1/2	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.44	I	C	3	PC	Str	Del	Del	P-B&B	War	R-Sne	1/2 Col	4.66	E-F	E-T	Mec*	Ros	O-47	
Essex.....6	110 1/2	31x3 3/4	No	Own	6	6-2 1/2 x 4	16.54	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	5.60	E-R	I-R	None	Own	S-54 1/2	
Flint.....40	115	30x4	Yes	.....	.....	6-3 1/2 x 4 1/2	23.44	L	.....	.....	.....	Til	A-L	A-L	P	War	.....	1/2 Ad	4.77	E-F	E-F	Mec*	.....	S-54	
Flint.....55	120	32x4 1/2	Yes*	Cont	Spec	6-3 1/2 x 5	27.34	L	C	7	PC	Str	Del	Del	P-Own	War	M-Spi	1/2 Ad	4.77	E-R	I-R	Mec*	War	S-54	
Ford.....T	100	30x3 1/2	No	Own	T	4-3 3/4 x 4	22.50	L	C	3	Sp	(Own/Hol)	Own	Own	D-Own	Own	M-Own	1/2 Own	3.63	E-T	I-R	None	Own	O-43 1/2	
Franklin.....10-C	115	32x4 1/2	Yes*	Own	10-C	6-3 1/4 x 4	25.35	I	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	F-Own	4.73	E-T	E-R	None	Own	E-38	
Gardner.....Series 5	112	32x4	Yes*	Lyc	Spec	4-3 1/4 x 5	21.76	L	A	5	PC	Zen	Wes	Wes	P-B&B	Mec	M-Pet	1/2 Fli	4.80	I-R	I-R	None	Ros	E-51	
Gray.....0	104	30x3 1/2	No	Own	R	4-3 3/4 x 4	21.03	L	C	3	Sp	Seo	Wes	Wes	P-Own	Det	R-Sne	1/2 Tim	3.90	I-R	I-R	None	Own	Q-30	
H.C.S.....Series 4	120	32x4 1/2	No	Weid	Spec	4-3 3/4 x 5 1/2	22.50	I	C	3	PS	Str	Del	Del	D-B-L	B-L	M-Spi	1/2 Own	4.63	I-R	I-R	None	Gem	S-56	
H.C.S.....Series 6	126	32x5	Yes*	Own	.....	6-3 1/2 x 5	29.40	I	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	1/2 Own	4.63	I-R	I-R	None	Gem	S-56	
Hatfield.....6-55	121	32x4	No	H-Sp	40	6-3 1/2 x 5	25.35	L	C	3	PS	Str	Bos	Bos	P-B&B	Dur	M-Spi	1/2 Col	4.63	E-R	I-R	None	Gem	S-58	
Haynes.....60	121	32x4 1/2	Yes*	Own	60	6-3 1/2 x 4 3/4	29.40	L	C	3	PS	Ray	Kin	L-N	D-Own	Mec	M-Thi	1/2 Own	4.41	E-R	E-T	None	Jac	S-54 1/2	
Hudson.....Super 6	127	34x4 1/2	No	Own	6																				





# WEED CHAIN Dealer Helps

## Selling Chains This Summer

Heavy summer rains cause as much skidding as winter's snow and slush—creating an opportunity to sell many sets of Weed Chains.

“Prepare for a Rainy Day” is what we tell your customers in our National Magazine and billboard advertising. You help the cause along when you display Weed Chain Counter Cards, Window Cards and Window Strips shown here.

AMERICAN CHAIN COMPANY, INC.  
BRIDGEPORT, CONN.

In Canada:  
DOMINION CHAIN COMPANY, Ltd., Niagara Falls, Ont.

District Sales Offices:  
Boston Chicago New York Philadelphia  
Pittsburgh San Francisco

World's Largest Manufacturers of Welded and Weldless Chains for All Purposes



A combination set of one window and two counter cards sent on request—order by No. "13"

**Come in now and buy  
WEED TIRE CHAINS**  
*We use 'em ourselves*

A quantity of window strips also sent on request—order by No. "9"

AUTO SUPPLIES

**NAME WEED  
ON EVERY HOOK**



# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE								Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Spring
		Standard Size (Ins.)†	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make				Generator and Starter Make	Type and Make	Make	Type and Make	Type and Make	Gear Ratio†		
Paige.....	131	33x4½	Yes*	Cont	Spec	6-3¾x5	33.75	L	C	4	PC	Ray	A-K	Rem	D-Lon	W-G	M-Mec	½ Tim	4.90	E-R	I-R	None	Gem	S-61¼
Peerless.....	126	33x6.2	Yes	Own	70	6-3½x5	29.40	L	C	7	PC	Joh	Del	Del	D-Own	Own	M-Spi	½ Tim	4.66	E-F	I-R	Hyd*	Gem	S-54
Peerless.....	128	33x5	Yes*	Own	66	8-3¼x5	33.80	L	C	3	PC	Bal	Del	Del	D-Own	Own	M-Spi	½ Tim	4.90	E-R	I-R	Hyd*	Gem	S-60
Pierce-Arrow.....	138	33x5	No	Own	33	6-4 x5½	38.40	T	C	7	FP	Own	Del	Del	D-Own	Own	M-Spi	½ Own	4.29	E-R	I-R	Hyd*	Gem	S-57½
Premier.....	126½	32x4½	Yes*	Own	6-D	6-3¾x5½	27.34	I	A	3	PC	Str	Del	Del	D-B&B	Own	M-Blo	½ Col	4.58	E-R	I-R	Hyd*	Own	S-57½
R & V Knight.....	124	32x4½	No	Own	Kni	6-3½x4½	29.40	X	C	4	PC	Str	A-L	A-L	P-B-L	B-L	M-Spi	½ Tim	5.40	E-R	I-R	None	Jac	S-61
Reo.....	120	32x4	Yes*	Own	T6	6-3½x5	24.34	G	A	4	PS	Ray	NE	NE	D-Own	Own	M-Spi	½ Tim	4.70	E-R	I-R	None	Own	S-54½
Revere.....	131	32x4½	Yes*	Mons	4	4-4¾x6	30.63	H	A	2	PS	Str	Bos	Wes	D-B-L	B-L	M-Spi	¾ Stn	3.44	E-R	I-R	None	Gem	S-58
Rickenbacker.....	117	32x4	Yes*	Own	C	6-3¼x4¾	23.44	L	C	3	PC	Str	Bos	Bos	P-Own	Own	M-Mec	¾ Own	5.10	I-F	E-T	None	Gem	S-57
Roamer.....	118	32x4½	No	Cont	12XD	6-3½x5½	29.40	L	A	3	PS	Str	Bos	Wes	P-B&B	Own	R-M&E	¾ Tim	4.60	E-R	I-R	Mec*	Jac	V-55½
Roamer.....	138	32x4½	No	Dues	G1	4-4¼x6	28.90	H	A	3	FP	Str	Bos	Wes	D-B-L	B-L	R-M&E	¾ Tim	4.63	E-R	I-R	Mec*	Jac	V-55½
Rollin.....	112	21x5¼	Yes	Own	G	4-3¼x4¾	16.90	L	A	4	PC	Til	Con	Dyn	P-B&B	Mun	R-Sne	½ Sal	5.10	E-F	E-F	None	Dit	S-46½
Rolls-Royce.....	143½	33x5	No	Own	40	6-4½x4¾	48.60	L	A	7	FP	Own	Bos	Bos	K-Own	Own	R-Mown	½ Fown	3.72	I-R	E-F	None	Own	V-54½
Seneca.....	112	31x4	No	Lyc	CF	4-3¾x5	21.03	L	A	5	PC	Zen	A-L	A-L	P-B&B	Own	M-Uni	F Pen	4.50	E-R	I-R	None	Dit	S-52
Stanley.....	130	32x4½	No	Own	750	2-4 x5	13.00	L	C	3	PS	Til	Non	Non	Non	Non	Non	¾ Ad	4.50	E-R	I-R	None	War	S-49
Star.....	102	30x3½	No	Cont	Spec	4-3¾x4¼	15.63	L	C	3	PS	Til	A-L	A-L	P-Own	Own	M-Spi	¾ Tim	4.87	E-R	I-R	None	War	S-49
Stearns-Knight.....	119	33x4½	No	Own	Kni	4-3¾x5½	22.50	X	C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Chi	¾ Own	4.50	E-R	I-R	Hyd*	Own	V-50
Stearns-Knight.....	130	33x5	No	Own	Kni	6-3¼x5	25.35	X	C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Chi	¾ Own	4.70	E-R	I-R	Hyd*	Own	V-50
Stephens.....	117	32x4	No	Own	20	6-3½x4½	25.35	I	C	3	FP	Str	Del	Del	P-B&B	Mec	M-Mec	½ Tim	5.10	E-R	E-T	None	Gem	S-58
Sterling-Knight.....	124	33x4½	No	Own	Kni	6-3¼x4¾	25.35	X	C	7	FP	Str	Wes	Wes	D-Ful	Ful	R-Chi	½ Tim	4.56	E-R	I-R	None	Ros	S-58
Stevens Duryea.....	138	33x5	No	Own	G	6-4½x5½	47.25	L	C	4	PC	Str	Bos	Bos	D-Own	B-L	M-Spi	½ Tim	3.76	E-R	I-R	None	Ros	S-57½
Studebaker.....	112	31x4	No	Own	EM	6-3½x4½	23.44	L	C	4	PS	Str	Wag	Wag	P-Own	Own	R-The	½ Own	5.00	E-R	I-R	None	Own	S-50
Studebaker.....	119	32x4	No	Own	EL	6-3½x5	29.40	L	C	4	PS	Str	Wag	Wag	P-Own	Own	M-Spi	½ Own	4.33	E-R	I-R	None	Own	S-56
Studebaker.....	126	33x4½	No	Own	EK	6-3¾x5	36.04	L	C	4	PS	Bal	Wag	Wag	P-Own	Own	M-Spi	½ Own	3.71	E-R	I-R	None	Own	S-56
Stutz.....	120	32x4½	No	Own	6-90	6-3¾x5	27.34	I	B	3	FP	Str	Rem	Rem	P-B&B	W-G	M-Mec	½ Tim	4.66	E-R	I-R	None	Gem	S-62
Stutz.....	130	32x4½	No	Own	KLDH	4-4¾x6	30.63	T	C	3	PC	Str	Del	Rem	D-W-G	Own	M-Har	¾ Tim	3.75	I-R	I-R	None	Gem	S-60
Stutz.....	130	32x4½	Yes*	Own	695	6-3½x5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Uni	¾ Tim	4.66	E-R	I-R	Hyd*	Gem	S-61¼
Templar.....	122	33x4	No	Own		6-3¾x5	27.34	L	C	...	PS	T 1	Dyn	Dyn	P-M&E	War	R-Sne	¾ Sal	5.10	I-F	E-T	Mec	Ros	S-54
Velie.....	118	32x4	Yes*	Own	56	6-3¾x4¼	24.38	I	C	4	FP	Str	Wes	Wes	P-B&B	Dur	M-Thi	½ Own	5.10	E-R	I-R	Hyd*	Ros	S-55
Westcott.....	125	32x4½	Yes*	Cont	12X	6-3½x5¼	29.40	L	A	3	PS	Ray	Del	Del	P-B&B	B-L	M-Pet	½ Tim	4.45	E-R	I-R	Mec*	Gem	S-59
Westcott.....	120	32x4½	Yes*	Cont	8R	6-3¾x4½	27.34	L	C	4	PC	Rav	De	De	P-B&B	War	M-Pet	½ Col	4.90	E-R	E-T	Mec*	Gem	S-57½
Westcott.....	118	32x4½	Yes*	Cont	8R	6-3¾x4½	27.34	L	C	4	PC	Ray	De	De	P-M&E	War	M-Pet	½ Col	4.66	E-R	E-T	Mec*	Gem	S-57½
Willis Ste. Claire.....	121	32x4½	Yes	Own	68	8-3¼x4	33.80	I	C	3	FP	Sch	De	De	P-Own	Own	M-Spi	¾ Eat	4.45	E-F	I-R	None	Own	S-54½
Willis Knight.....	127	32x6	No	Own	64	4-3¾x4½	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	¾ Own	4.44	E-R	I-R	None	Own	S-55
Willis Knight.....	118	32x4	No	Own														5.12						
Willis Knight.....	124	32x4½	No	Own																				
Checker.....	117	32x4½	No	Buda	WTU	4-3¾x5½	22.50	L	C	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	¾ Col	4.87	E-R	I-R	None	Jon	S-57½
Dodge.....	116	32x4	Yes*	Own		4-3¾x4½	24.03	L	A	3	SP	Ste	N-E	N-E	D-Own	Own	M-Own	½ Tim	4.54	E-R	I-R	None	Own	S-55
Driggs.....	108½	30x3½	No	Own		4-2¾x4½	11.03	L	C	3	PS	Ste	N-E	N-E	D-Ful	Ful	M-Spi	½ Tim	4.75	E-R	I-R	None	Own	S-55
Elcar.....	118	33x4½	No	Lyc	CF	4-3¾x5	21.03	L	A	5	PC	Car	Del	Del	P-B&B	Mun	Pet	¾ Sal	4.75	E-R	I-R	None	CAS	S-51
Elcar.....	118	33x4½	No	Cont	8R	6-3¾x4½	27.34	L	C	4	PC	Str	Del	Del	P-B&B	War	Spi	¾ Sal	4.75	E-R	I-R	None	Gem	S-52
Kelsey.....	112	32x4	No	Lyc	CH	4-3½x5	19.60	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	¾ Sal	5.10	E-R	I-R	None	Lav	S-55
Pennant.....	115	33x4½	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	¾ Col	4.87	E-R	I-R	None	Jon	S-57
Pennant.....	118	33x4½	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	¾ Col	4.70	E-R	I-R	None	Own	S-57½
Rauch & Lang.....	112	32x4	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	Zen	Bos	Dyn†	P-Det	Det	Spi	½ Sta	5.10	E-R	E-T	None	Gem	S-50½
Rauch & Lang.....	102	33x4½	No	Own		Electric									None	None	Own	Own	8.60					
Reo.....	113	33x4½	Yes*	Own		6-3½x5	24.30	G	A	...	PS	Ray	N-E	N-E	D-Own	Own	Own	¾ Own	4.70	E-R	I-R	None	Own	S-55
Traveler.....	108½	32x4	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	...	Eis	Eis	B-L	W-M	Spi	Col	...	E-R	I-R	None	Gem	S-55
White.....	119	34x4½	No	Own		4-3¾x5½	22.50	L	C	3	Sp	Zen	N-E	N-E	P-Own	Own	Own	½ Own	5.12	E-R	I-R	None	Own	S-55
Willis Knight.....	118	32x4½	No	Own		4-3¾x4½	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	Own	¾ Own	5.12	E-R	I-R	None	Own	S-55
Yellow.....	109	32x4½	No	Cont	V7	4-3¾x5	18.23	L	C	3	PC	Zen	Bos	N-E†	B-L	B-L	Spi	½ Tim	4.90	E-R	E-T	None	Gem	S-56
Yellow.....	109	29x4½	Yes	Cont	V7	4-3¾x5	18.23	L	C	3	PC	Zen	Bos	N-E†	B-L	B-L	Spi	½ Tim	4.90	E-R	E-T	None	Gem	S-56

## TAXICABS

### ABBREVIATIONS—

\*—Electric  
 †—Generator only  
 \*—At extra cost  
 ‡—On Phaeton models  
 A—Aluminum  
 Anst—Ansted  
 Ad—Adams  
 A-K—Atwater-Kent  
 A-L—Auto-Lite  
 B—Ball & Ball  
 B & B—Borg & Beck  
 B-F—Both Internal and External Four Wheels  
 Bij—Bijur  
 B-L—Brown-Lipe  
 Blo—Blood  
 Bos—Bosch  
 C—Cast Iron  
 Car—Carter  
 Cl—Climax  
 Col—Columbia  
 Con—Connecticut  
 Cont—Continental

D—Multiple Disk  
 Del—Delco  
 Det—Detroit  
 De J—De Jon  
 Dit—Ditwiler  
 Doo—Dooley  
 Dtl—Detlaff  
 Dues—Duesenberg  
 Dur—Durstion  
 Dyn—Dyneto  
 E—Full Elliptic  
 E-F—External Four Wheels  
 E-T—External Transmission  
 Ent—Eaton  
 F—Full Floating  
 Fall—Falls  
 FH—Flint  
 FP—Full Pressure to all bearings including wrist pins  
 Ful—Fuller  
 1/2 F—Semi-Floating  
 3/4 F—Three-Quarter Floating  
 G—Head and Side  
 G-D—Gray & Davis  
 Gem—Gemmer

G-L—Grant-Lees  
 Goo—Goodrich  
 H—Horizontal  
 Har—Hart  
 Hol—Holley  
 Hoo—Hoosier  
 H-Sp—Herschell-Spillman  
 Hyd—Hydraulic  
 I—In Head  
 I-F—Internal Four Wheels  
 I-R—Internal Rear Wheels  
 J—Three-Quarter Elliptic  
 Jac—Jacox  
 Jax—Jaxon  
 Joh—Johnson  
 Jon—Jones  
 K—Cone  
 Kin—Kingston  
 L—L Head  
 Lav—Lavine  
 Lon—Long  
 L-N—Leece-Neville  
 Lyco—Lycoming  
 Mar—Marvel  
 M—Metal

M & E—Merchant & Evans  
 Mec—Mechanics  
 Mons—Monson  
 Mun—Muncie  
 N—Platform  
 Non—None  
 N.E.—North East  
 Nor—Northway  
 O—Special Type  
 P—Single Plate  
 PC—Pressure to all Crankshaft and connecting rod bearings  
 Pen—Penfield  
 Pet—Peters  
 Pic—Pick  
 PS—Splash with Pressure  
 Q—Quarter Elliptic  
 R—Fabric  
 Ray—Rayfield  
 Rem—Remy  
 Roc—Rockford  
 Ros—Ross  
 S—Semi Elliptic  
 Sal—Salisbury  
 Sch—Schebler

Sco—Scoe  
 Sne—Snead  
 Sp—Circulating Splash  
 Spe—Special  
 Spl—Spicer  
 Spl—Splittorf  
 S.E.—Standard Equipment  
 Sta—Standard  
 Ste—Stewart  
 Str—Stromberg  
 T—T Head  
 The—Thermoid  
 Thi—Thierner  
 Til—Tillotson  
 Tim—Timken  
 Uni—Universal  
 V—Cantilever  
 W-G—Warner Gear  
 W-M—Willys-Morrow  
 Wag—Wagner  
 War—Warner  
 Weid—Weidely  
 Wes—Weistinghouse  
 Wis—Wisconsin  
 Y—Sleeve  
 Zen—Zenith





THE DAVIS UTILITY BROUGHAM

Model 79 - \$1595

—at the factory, plus tax

THE lowest-priced, standard, three-door, five-passenger enclosed car on the market, compared with the touring car price—the Davis Utility Brougham. Only \$200 more! Meets every motoring need—winter or summer. Distinctive—as are all Davis models—its daring value is making sales for Davis dealers.

GEORGE W. DAVIS MOTOR CAR COMPANY . . RICHMOND, IND.

# DAVIS

"BUILT OF THE BEST"

# A NEW TAILOR-MADE FAN BELT

for

## CHEVROLET

and

## other popular cars



### *Gilmer* Super-Service Moulded "V" Belts

Fair List Price	Made to Fit
Good Trade Profit	Flexible
Real Good-Will Builder	Sturdy and Durable
Conveniently Packed	Maximum Service
Permanently Identified	Minimum Attention

The first stocks of Gilmer Super-Service Moulded "V" Belts were shipped about two months ago. Already, nearly every jobber has re-ordered, **Dealers' Stocks are moving and profits are being made.**

On request, we will be glad to furnish full information.

#### Gilmer Radiator Connections

##### Complete with Clamp Bands

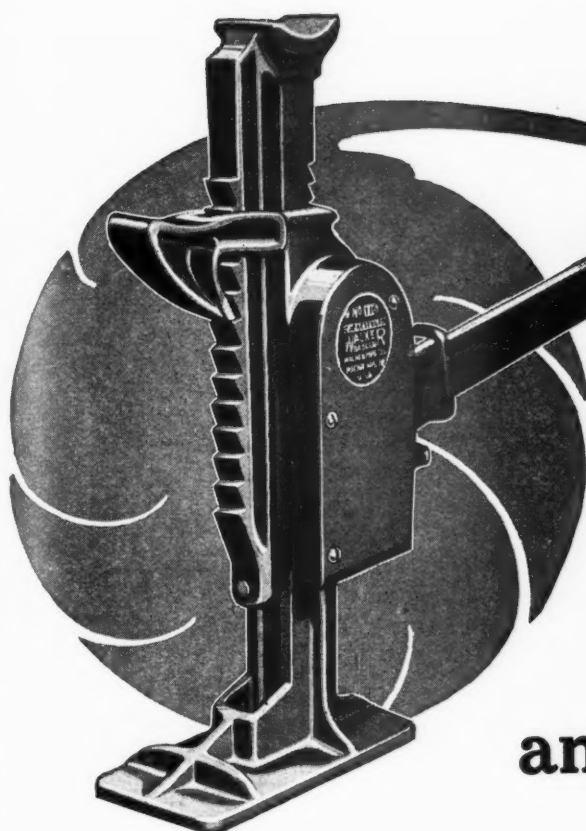
Gilmer Radiator Connections are ready for instant installation just as they come. They can be applied in an instant and are held firmly in place by strong rubber clamp bands. (No metal clamps required.) There are Gilmer Connections made to fit all popular cars and trucks. They are packed ten to the carton.



### L. H. GILMER CO.

Tacony, Philadelphia





# JACKS that are right-

and a display  
that sells them

14 years of progressive jack manufacture—14 years of work, study and experiment to build jacks that are absolutely right. Walker Jacks lead the field. The Walker line is the profitable, business-building line of jacks for you to handle.

Quick turnover is certain with Walker Jacks and the Walker Counter Display. This Display is a sure attention-getter. It puts the jack question squarely before every motorist that comes into your place of business.

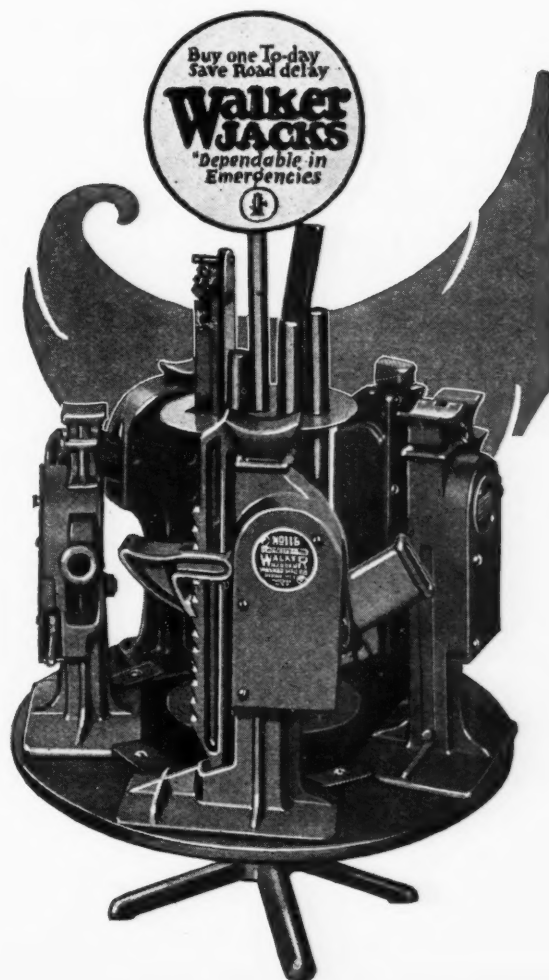
The jack market is a big one. Just consider this fact: 5 out of every 6 motorists need dependable Walker Jacks. The Counter Display will help you get the jack business you should. It's a real money-maker. Thousands of dealers are using it to increase their jack sales. Let it make money for you. Write your jobber today.

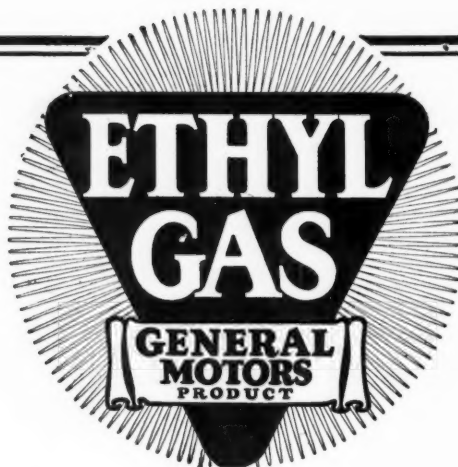
**WALKER MANUFACTURING CO.**  
Racine, Wis.

**Display Stand FREE** With an order for 10 standard fast-selling Walker Jacks (5 different models), you get the Counter Display Free. Attractively finished in three colors, blue, black and orange. Revolves showing every jack.

# Walker JACKS

"Dependable in Emergencies"





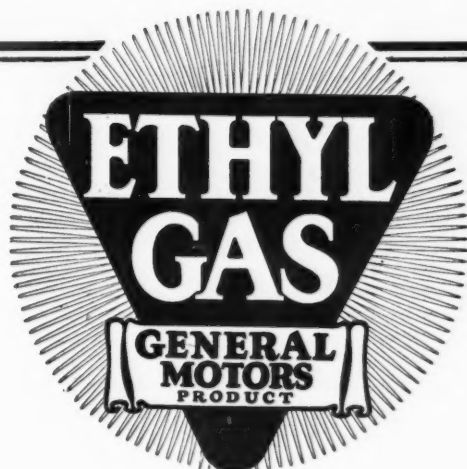
## What is Ethyl Gas?

Ethyl Gas is the most efficient automotive fuel in the world. It is the final result of years of patient research in the laboratories of the General Motors Corporation. More than 2500 substances were tested, and then eliminated, before one was finally found that was wholly efficient and commercially practical in every way. This new product, Ethyl Fluid, when added to gasoline in a quantity of one-tenth of 1 per cent, makes what is now known to thousands of motorists as Ethyl Gas. Ethyl Gas is now being marketed by some of the world's greatest oil companies, who have given it their most enthusiastic approval.

## What does Ethyl Gas do?

Ethyl Gas completely eliminates fuel "knocks"—and all of the loss of power, waste of gasoline and harmful effects of carbon accumulation that these "knocks" indicate. It causes the engine to run more smoothly, and by producing greater power from every atom of fuel, its use is more economical. Using Ethyl Gas, it is seldom, if ever, necessary to retard your spark. Gear shifting is reduced to a minimum. All these and many other benefits it performs without the slightest harm to the motor—indeed, it actually improves the condition of the motor. When servicing cars that have been using Ethyl Gas, the carbon deposit may have changed color to a grey or red. Do not let this mislead you. Grind valves colored this way in the same manner that you have always done.





## Who makes Ethyl Gas?

Ethyl Gas is produced by the General Motors Chemical Company of Dayton, Ohio—a subsidiary of General Motors. In charge of this company are such men as C. F. Kettering, president, inventor of the self-starter, and a widely known automotive authority. And Thomas Midgley, Jr., an expert in automotive fuels and the recipient of the Nichols medal from the American Chemical Society for work in the detonation of motor car fuels. Associated with these men are others who have devoted years to chemical and automotive research.

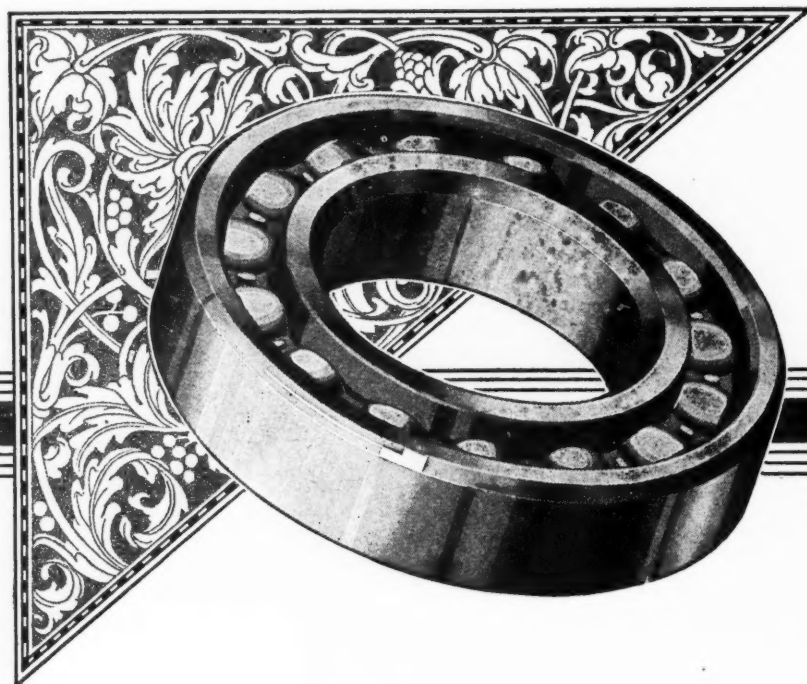
## How is Ethyl Gas Sold?

Ethyl Gas is put into the tank of the car in the same manner as ordinary gasoline. No adjustments of any kind are required on any car. The simple method of supplying Ethyl Gas is made possible by a device called the Ethylizer. Designed by the General Motors Chemical Company, this Ethylizer automatically mixes the Ethyl Fluid with gasoline to make Ethyl Gas. The ethylizing devices that are attached to the gasoline pumps at the service stations are regularly inspected by representatives of the General Motors Chemical Company.

## General Motors Chemical Company

*Subsidiary of General Motors Corporation*

Dayton, Ohio



New Departure Ball Bearings cost more to make and buy than many other types of anti-friction bearings. And the fact that more are purchased than any other is a splendid tribute to the sincerity of American motor car makers in the quest of quality.

THE NEW DEPARTURE MFG. COMPANY

Detroit

BRISTOL, CONN.

Chicago

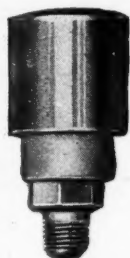
# New Departure Ball Bearings



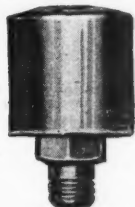
# It's here at last— AUTOMATIC LUBRICATION

## WEDFORD—CRITZ AUTOMATIC GREASE CUPS

# for every car



Note how cup is extended when full!

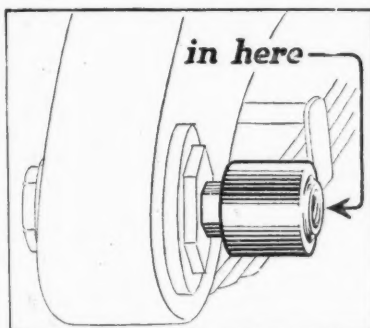


FULL

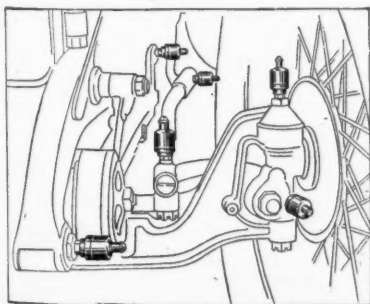
EMPTY

Just screw a

CRITZ ALEMITE or ZERK fitting



and fill with No. 3 or Medium cup grease.



Dependable automatic grease cup lubrication is at last a reality—with the new Wedford-Critz *constant pressure* lubricating system! Motorists *want* it! It promises to be the most popular improvement ever achieved in automobile lubrication! One size fits all cars.

WEDFORD-CRITZ is a system of Automatic Grease Cups into which No. 3, or Medium cup grease is forced under high pressure, either with Wedford-Critz, Alemite or Zerk lubricator. The cups retain a reserve supply of grease, automatically fed to the bearings under *constant pressure*, pushing through with each vibration of the bearings in such a manner that the action of the bearings spreads it entirely over the wearing surfaces.

WEDFORD - CRITZ AUTOMATIC GREASE CUPS are used in conjunction with the present lubricating systems already on the car by simply removing the lubricator fittings and screwing them into top of Automatic Cup and then screw the Cup into the bearings. Wedford-Critz Automatic Grease Cups make any good lubricating system nearer

100% perfect. They show at a glance when refilling is needed; required only after 750 to 1000 miles because the grease is fed to bearings *only when car is running*.

It means thorough lubrication. Less work. Better operation of car. Longer life. An end to "turning down" of dirty grease cups by hand. Fewer repairs. Easier riding. Try them on *shackle bolts* and *king bolts*. The results will convince you that they are needed on almost every bearing on the chassis.

Thousands of cars on the Pacific Coast are equipped with the Wedford-Critz Super-Pressure Lubricating System and the Automatic Cups. It means money in the tills of dealers! Reap the increasing profits from the growing wave of popular demand. Write for prices and discounts.

THE WEDLER-SHUFORD COMPANY, ST. LOUIS, U. S. A.

"A Wedford Product Always Sells"

The Wedford-Critz Super-Pressure Lubricating System is a time-saver. Produces greater pressure with less effort than any other high pressure lubricating gun on the market. Adapters to use on Alemite fittings are supplied extra.

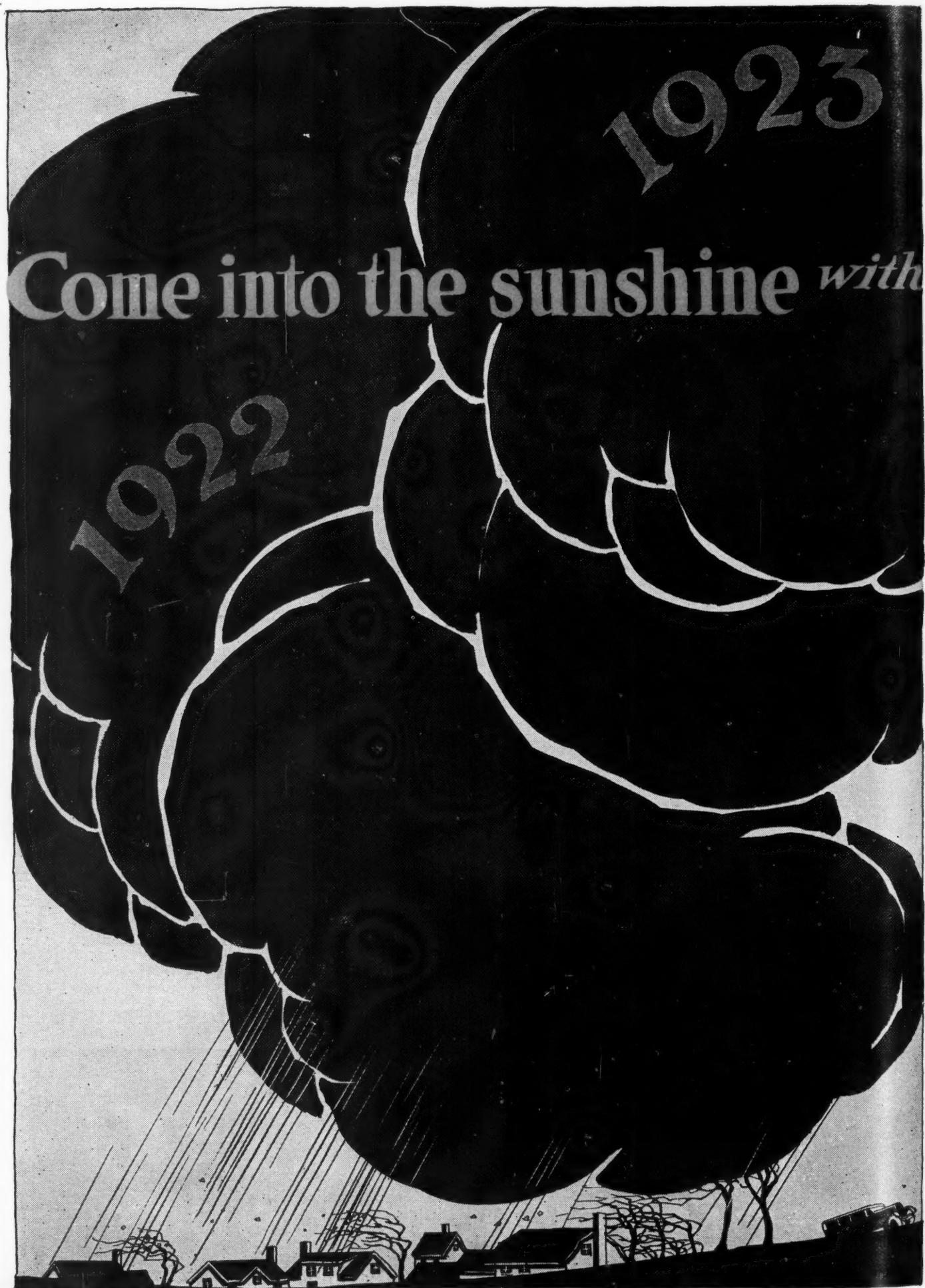


Colored Metal Counter Display  
Helps Make Sales

13x8" in. Offset 1 1/4 in. from bottom to hold 6 cups. Display free, on request, with order for cups.

# Wedford

## AUTOMOTIVE PRODUCTS





1924

Murray *"Not A Worry"* TIRES

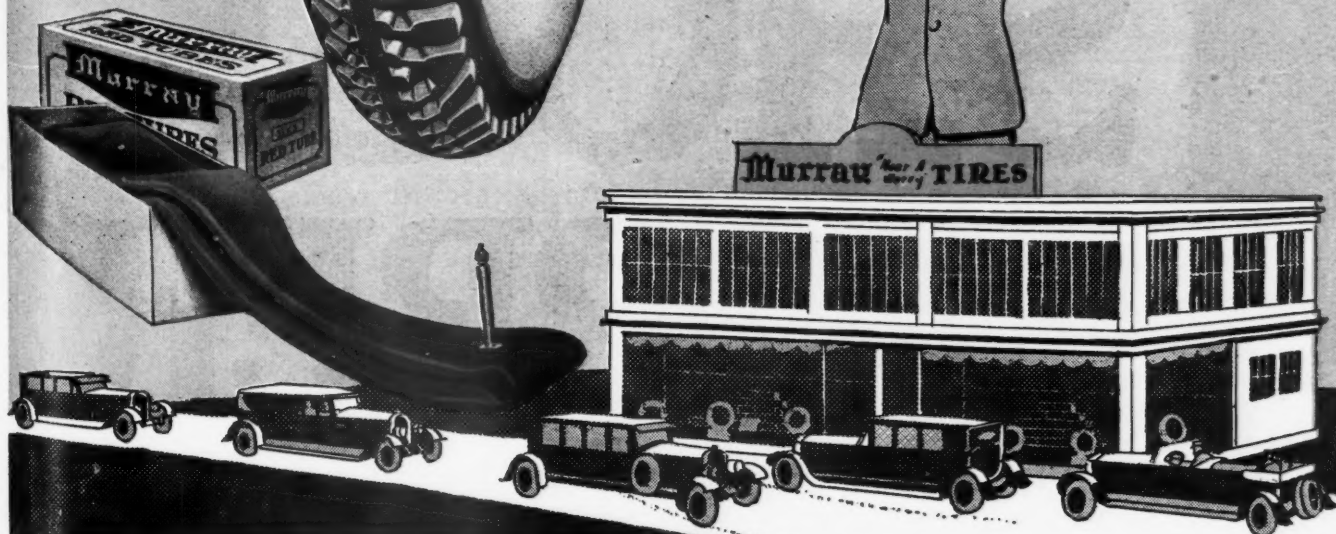
FOR Murray dealers in 1924 indications are "Continued Fair Weather."

Through the storms the last three years these rugged castings have stood strong and true, meeting every market condition without the slightest deviation from quality.

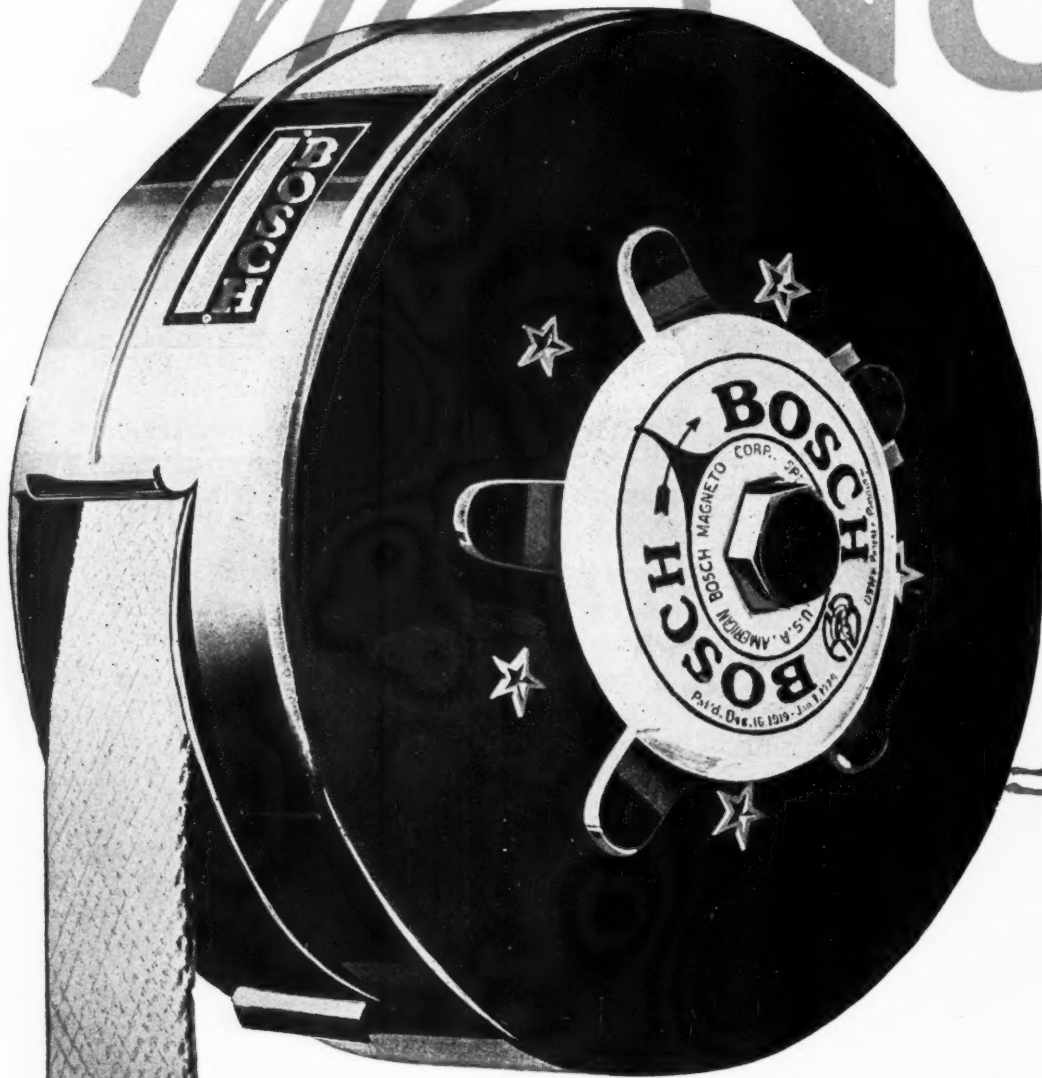
And now that the sun again is shining they'll more than make good for dealers who take advantage of the reputation they have made.

Write for our exclusive dealer's proposition. Be the sole distributor in your community for this quality Tire. We will be glad to discuss our distribution plan and show you how we can sell such a good tire at such a reasonable price.

Murray Rubber Company  
Trenton, N. J.



# The New



# SHOCK ABSORBER



# BOSCH



## *Smooths the Road*

Here's the Shock Absorber that is the "big seller" this year! Try it yourself and you'll agree—it makes such a wonderful improvement in a car's riding qualities you'll see in a minute why owners everywhere sing its praises!

It's a Bosch quality job clear through—It has the Bosch Reputation to back it—It has over 750 Bosch Service Stations to provide service. Everybody is hearing about it! Big full page ads in the Saturday Evening Post and other leading nationals are broadcasting its advantages continuously.

The Bosch is now the best advertised, most talked about shock absorber on the market—and dealers everywhere are making big profits! Now's the time to act—to get your place known as Bosch Shock Absorber Headquarters.

Wire for sample set at quantity discounts C. O. D. and start selling while the big advertising drive is on.



### Prices Per Pair

For Fords . . \$10.00  
In Canada . . . . . \$15.00

For Medium Cars  
\$15.00  
In Canada . . . . . \$22.50

For Heavy Cars &  
Trucks . . . \$20.00  
In Canada . . . . . \$30.00

## AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: Springfield, Mass. Branches: New York, Chicago, Detroit, San Francisco

# ALL AGREE

that the *Air-O-Meter*

## is the Life Saver of Tires

BECAUSE: The Air-O-Meter delivers CORRECT AIR PRESSURE desired and NO MORE. Auto owners everywhere will "go out of their way" for an Air-O-Meter, especially so if their machine is equipped with balloon tires, because these tires must have exact amount of air. The Air-O-Meter supplies it automatically as it is equipped with balloon tire pressure. No testing whatever is necessary when you use the Air-O-Meter.

Read what "they" say about the AIR-O-METER

### The Autoist Says—

"I prefer to use the Air-O-Meter because I know it delivers correct amount of air I want without testing. Naturally I always reciprocate by patronizing that station."

### The Gas Station Man Says—

"The Air-O-Meter saves me time. I don't have to assist customers because they use the device themselves. The road is cleared quickly and I can then serve more people."

### The Garage Man Says—

"I found out that tire gauges are not only costly but incorrect. I saved considerable money since I installed the Air-O-Meter. Besides it attracted many new customers to my place."

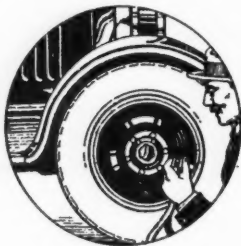
### The Tire Man Says—

"My customers tell me that their tires are giving them more mileage since they use the Air-O-Meter. They always have the correct amount of air, which prolongs the life of the tires."



#### ONE

Merely turn the handle to the exact pressure desired.



#### TWO

Apply hose to tire valve stem. Light appears, burns constantly as air is being delivered. Air stops automatically and light goes out when desired pressure is reached.



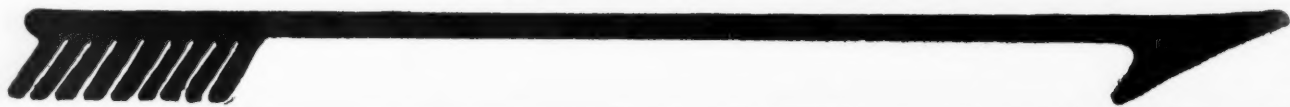
#### THREE

You are off in a minute—knowing that you have the exact amount of air in your tires.

Air-O-Meters are built in various styles and sizes. Write at once for full information.

THE MATTMAN & SINCLAIR CO., CINCINNATI, OHIO

# Air-O-Meter





## Only This Reverse Curve Can Stop Oil Pumping and Piston Slap Successfully

To centralize the piston, stop the slap and NOT increase the wall pressure is **impossible without this long reverse curve.**

To make the ring face work flush with the cylinder wall, stop oil pumping and NOT interfere with the oil film is **impossible without this long reverse curve.**

To renew power, performance and pick-up and NOT cause excess wear on cylinder wall and ring face is impossible without this long reverse curve.

### GENUINE Apex Innerings

are the only ones that can give you this long reverse curve. This is our patented design and can be used by no one else. No imitations can do, successfully and harmlessly, all that we claim.

The country's biggest jobbers stock Apex. They would have no other. They recognize the fact that Genuine Apex Innerings were the first ever made and that all others are imitations of this guaranteed product.

They know that had it not been for this company there would have been no Innering business or profits for anyone.

They know, too, that in this company there is sufficient financial strength to back up our guarantee.

These are the reasons why the best known jobbers in the United States and Canada stock and push "Apex" in preference to all others.

Genuine Apex Innerings are made from the finest imported Swedish Steel; tested up to 900 degrees F.; guaranteed to renew motors without reboring—but they cost no more than inferior kinds and carry a jobber and dealer discount that is unapproached by any imitation.

Retail  
20c Each  
Extra Large Sizes  
35c Each

Thomson Manufacturing Co.  
Dept. C

Peoria, Ill.

Patented in U. S.  
and Canada

#### Rounded Points

The short rounded points of contact **FOUND ONLY ON GENUINE APEX INNERINGS**, cannot break. This is not the case where a sharp bend is necessary to avoid infringing on the Apex patent.

#### Reverse Curves

The long reverse curves, **FOUND ONLY ON GENUINE APEX INNERINGS**, gently hold the piston rings in place while the shorter rounded curves centralize and stabilize the pistons and thereby stop oil pumping and piston slap without exerting undue outward pressure on the piston ring.

**Special Try-Out Plan**  
Good jobbers can try out Genuine Apex Innerings in an economical way. We carry the load during the "try-out" period. Write for the details of this plan today.

#### To Dealers

Ask your jobber for our new discounts. If your favorite jobber does not stock Genuine Apex Innerings send your order direct to us and we will ship immediately. Always insist on Genuine Apex Innerings. No good jobber will substitute but be sure and mention the name "Apex" when ordering Innerings and be safe.



**"If It Isn't an APEX—It Isn't an INNERING"**



# Balloon Tires

25 lbs., 2½ minutes Easy Pumping—30 lbs., 3 minutes

That's the time for complete inflation—but the place where the owner of balloon tires gets the greatest value from this pump is in keeping his tires at exactly the right pressure all the time. A few quick, smooth strokes turns the trick. With a hard-working pump the job of keeping balloon tires at correct pressure would be a nuisance.

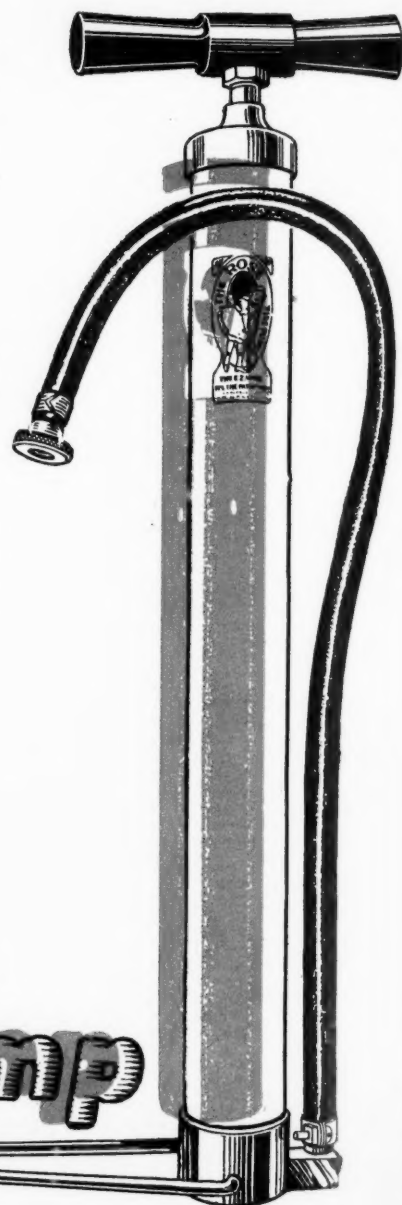
## Exact Pressure Is Vital

Manufacturers of balloon tires are emphatic in their caution to owners that they keep their tires at exactly the right pressure at all times. Five pounds one way or the other makes a big difference. The Rose Balloon Pump will supply that five pounds pressure in 30 seconds.

A great pump. Good for all tires but made especially with this

new need of balloons in mind. Beautifully finished in scarlet enamel and nickel. Embodies the Rose Valve feature. Guaranteed five years. Sells for \$3.50.

Stock it at once. Sell one with every set of balloons. Sell them to customers who want the very finest pump they can buy. There's a liberal profit for you in every sale. Ask your jobber.



# ROSE

## Easy Valve Action

# Balloon Tire Pump

FRANK ROSE MFG. CO., Hastings, Nebr.





## If It's Marked with a It's a Genuine Spring— built to the car makers' specifications

Both you and the car owner can now easily identify genuine Detroit Springs—each clip bolt head is marked with a raised letter "D"; the same marking is also stamped on the short plate of each spring.

And when you install a spring with that mark on it, both you and the car owner know positively that it will duplicate the original equipment in every way—in length, width, number and thickness of leaves, composition of steel, etc. *Every* Detroit Spring is built to the car makers' specifications, to give the long life and service and the easy-riding quality the car maker planned.

### You Can Get Them Quickly

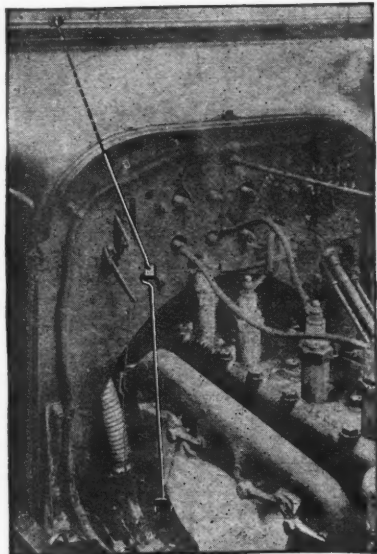
There is a Detroit distributor near you with a complete stock of Detroit Springs. The next time you have a replacement job, telephone him. He'll deliver the spring you want, *in a hurry*. A postal will bring full information including a schedule of discounts.

DETROIT STEEL PRODUCTS CO., 2268 E. Grand Blvd., Detroit, Mich.



**BUILT TO THE CAR MAKERS' SPECIFICATIONS**

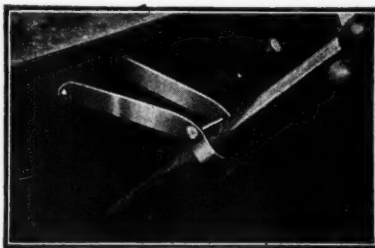
# Are you selling all these Krafve Products and getting all the profit?



**Krafve Gas Adjuster**

Brings carburetor adjustment to the dash. A convenience that earns its cost in added flexibility and fuel economy. The aluminum dial is a good looking addition to the instrument board. Model A for Sedan—Model B for Touring Car, Coupe or Runabout. Price \$1.00.

**Y**OU can figure on a good selling season this Spring and Summer with these Ford improvements to boost your sales. Krafve Automotive Products have always been good sellers because every Ford owner **NEEDS** these improvements and the low price makes the prospect a buyer.



**Krafve Steering Column Brace**

Holds the Ford steering column rigid at all times. Fastened to upper part of dash. Made of pressed C.R. steel and complete with all attachments. The low price means easy sales. Enameled.....75c. Nicked.....\$1.00

Krafve products show a good profit and turnover—being all year 'round sellers.

## **The Krafve Mixer Intake Manifold gives them a new Ford for \$5**

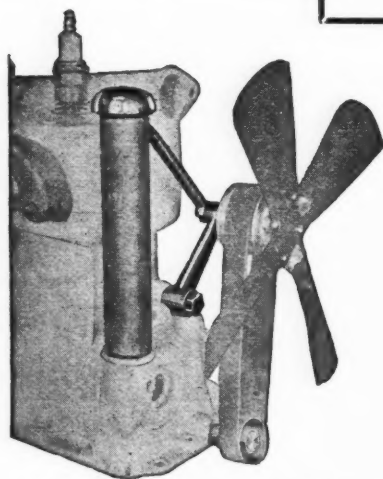
The Krafve Mixer Intake Manifold remedies gas sluggishness and incomplete mixture. The flattened construction spreads out the low gravity gas and completely vaporizes it producing a uniform high powered fuel.

Results—easy starting, quick pick up, increased speed, power and flexibility, increased mileage and a noticeable saving of gas and oil.

Ford owners won't let a five dollar bill keep them from these improvements.

Installation easily made as the Krafve is interchangeable with the regular Ford Manifold.

Dealers and Jobbers:  
Write for interesting sales plan.



**Krafve Oil and Fan Pipe**

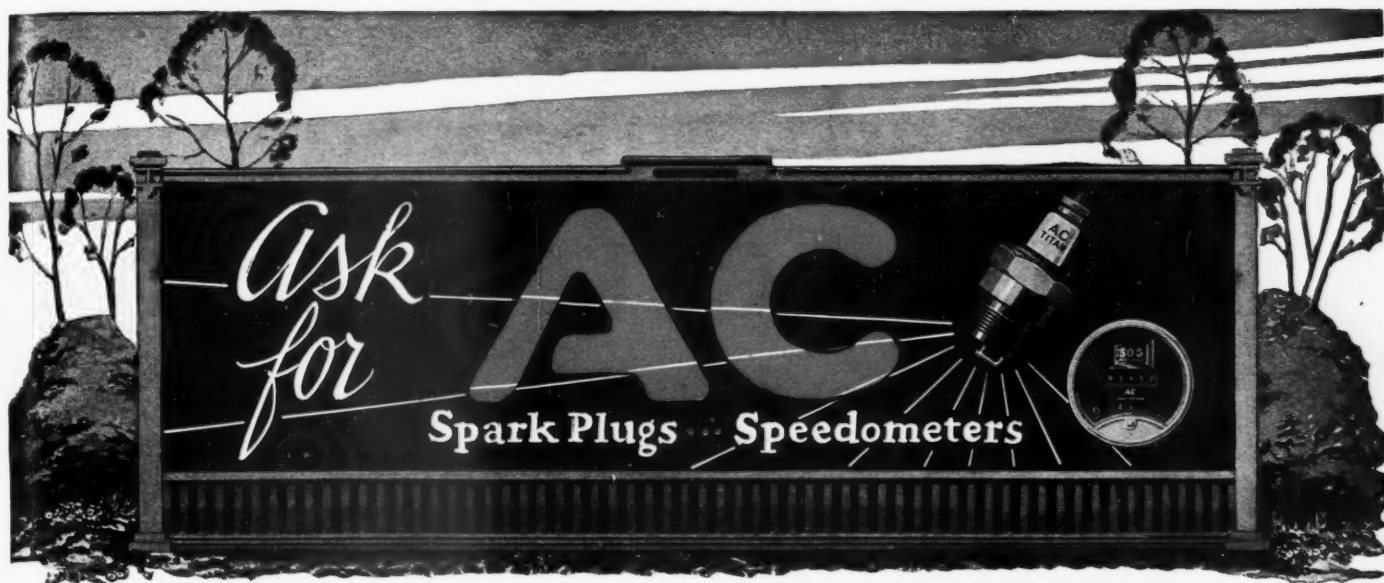
Makes it easier to pour oil into the crankcase and keeps fan belt tightened. Installed in a minute. Price \$1.00.



**Krafve Automotive Corporation**  
Oakham, Mass.







## These Painted Boards Are Working For You Everywhere—Every Day

All over America—wherever motorists travel—big, impressive painted bulletins advertising AC Spark Plugs are working every day for the dealer who stocks AC's.

National magazines, trade papers, store signs, direct mail advertising are continuously circulating millions of AC messages throughout the country—and newspapers too are spreading the story of AC superiority.

All this effective advertising, backed up by the factory equipment business of over two hundred manufacturers of cars, trucks and tractors, not only creates an assured market for the dealer, but makes AC's the best known and easiest selling spark plugs to stock.

Likewise they are the most profitable.

AC Spark Plug Company, FLINT, *Michigan*

*Makers of AC Spark Plugs—AC Speedometers*

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

# Kelso Clutch Facings Fit Accurately

*Long  
Life*

*Ease of  
Installation*

## They Go Right Into Place

—without additional fitting. Every Facing is carefully built to exact dimensions, with holes cleanly drilled and counter sunk. They cut labor costs and insure greater profits on your clutch facing jobs.

*Kelso Clutch Facings Are Woven from  
Long Fibre Asbestos*

—over brass wire of great tensile strength. They are then impregnated with a special Kelso Friction Compound. Each individual facing is compressed into a dense, solid mass under a pressure of 250 tons. The facings are then carefully drilled and counter sunk, ready for installation without the usual tedious fitting.

*Write the Kelso Distributor or  
direct to us.*

*All Sizes  
in Stock*

*Operation  
Smooth*

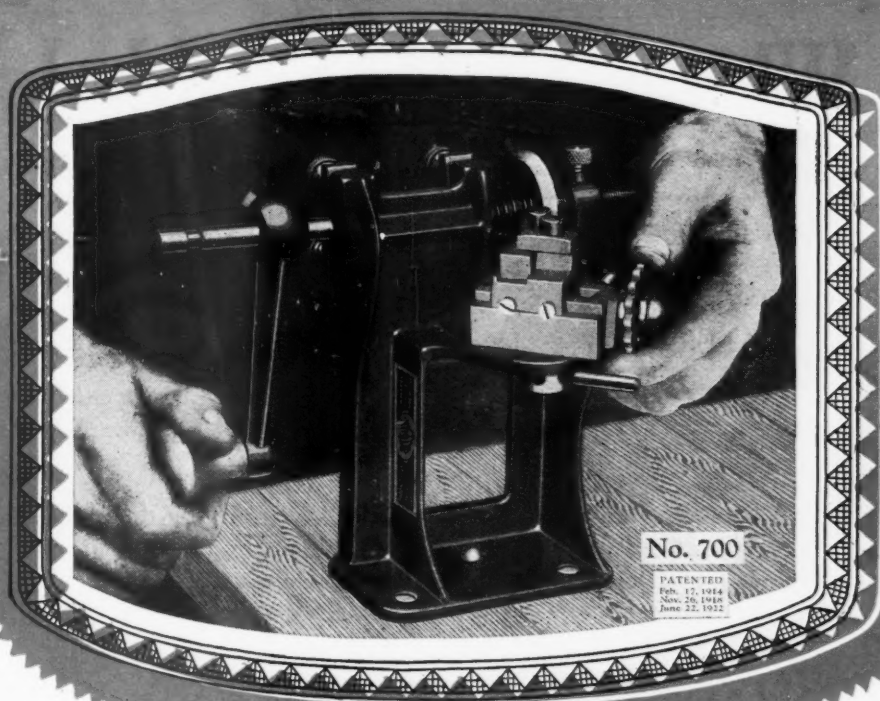
*EverReady*  
**CLUTCH  
FACINGS**

KELSO MANUFACTURING CO.  
TRENTON, N. J.

# Kelso

*EverReady*  
**BRAKE  
LININGS**





## LITTLE SIOUX VALVE LATHE

Valves should be refaced before grinding in—

especially if they are pitted, carbon coated or warped. That is the only way to be sure of a perfect job. A few turns on the Little Sioux Valve Lathe will give a smooth, even, clean face, requiring very little grinding in to make it seat perfectly.

The Little Sioux Valve Lathe refaces—quickly and accurately—any valve up to  $2\frac{1}{2}$ ", 30, 45 or 60 degree angle. It cuts the hardest steel valves—even *tungsten steel*. Its *circular cutter* leaves no ridges, and cannot get out of cutting line with the

valve. It stays sharp a long time. The *center adjustment* has a positive stop. When set for a certain size valve it will always be perfectly centered for the same size valve. Two Clamp Devices hold valve stem in perfect alignment.

Your Jobber Sells It

ALBERTSON & CO.

SIOUX CITY, IOWA

Trade Mark Reg. **SIOUX** U.S. Patent Office



# Why not this added Service with air?



With this Brunner Paint Sprayer and Cleaner you can do all paint jobs five times quicker than with a brush and much better. You can do all cleaning jobs even of the parts that are hard to get at—better and more quickly. You can offer a service which will bring in real profits.

If you buy a Brunner Air Compressor and put it solely to the job of filling tires you will utterly waste a big part of its capacity to serve you.

A Brunner, properly selected for your needs, will not only give you air aplenty for your "free air" service—it will also supply compressed air for use in your shop.

There are many shop jobs that can be handled better and more economically with air than in any other way—and these are pay jobs which will soon bring back to you the cost of the compressor equipment.

This wider usefulness of air emphasizes the need of a good compressor—one that is built with the utmost care and to the highest standards of design.

Because a Brunner is the best built compressor it is the one usually chosen for the modernized garage or service station.

A Brunner starts quickly, works fast, runs smoothly with no vibration, costs little to maintain, is super safe and gives years of trouble-free service.

Ask for the Brunner Book "AIR PROFITS"—it's free.

**BRUNNER MFG. CO., UTICA, N. Y.**

*Oldest and Largest Manufacturers of  
Garage Air Compressors in the World*

Cincinnati

Kansas City

San Francisco

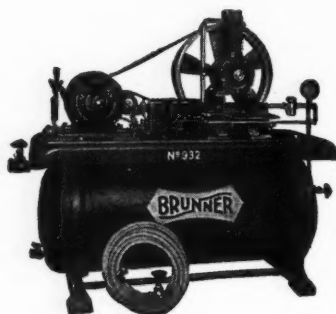
Export Office—Utica



## BRUNNER MODEL 932 Assembled Unit

*Largely self-operating—includes a remarkable unloader—controller which maintains desired tank pressure, at same time relieving motor of starting load.*

*Has Brunner doubly adjustable belt tightener, patented non-pounding Brunner check valve, and double tested Brunner tank guaranteed for working air pressure of 175 lb. per sq. in. Noiseless—vibrationless—good for 20 years at hard labor.*



AIR PROFITS

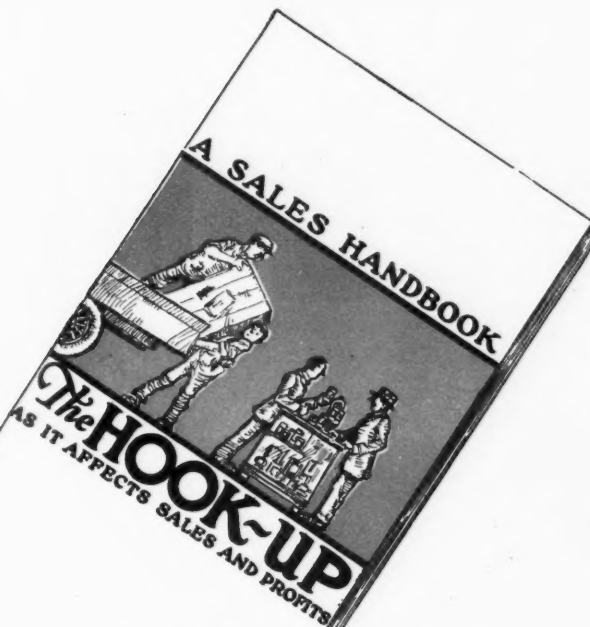


free



# FREE

Write for your copy today. The edition is nearly exhausted.



## Easy for the fellow on the inside!



### Se-Ment-Oil

The original Radiator Repairer. The only repair guaranteed for the life of the machine. In liquid or powder form.

### Cup Grease

Made from selected high grade stock blended into grease. Does not melt in warm weather nor channel in extreme cold.

### Olive Oil and

### Linseed Oil Soaps

Free from alkali—the ideal car washing soaps. Keeps varnish elastic—adding to its life.

### Transmission Compound

Stringy, sticky, fibrous—it adheres to gears giving continuous unflinching lubrication.

### Norwesco Products

cover the whole range of the dealers and car owners needs. The line is complete—and there is a sales advantage in handling one good line.

THE fellow on the inside holds the favored position—it's the chap on the outside that strains and does the worrying and perhaps eventually drops out of the running.

Be on the inside. Know how and where to buy. Have a close "Hook-up" with the men from whom you buy.

In the handbook, here offered free, the Norwesco "Hook-up" is fully described besides which

the basic principles of buying, as it affects selling and profits, are set down in concise, usable form.

Whether or not you handle the Norwesco Line, the reading of this informative booklet cannot fail to be beneficial.

Write for your copy.

The Northwestern Chemical Co.

Marietta

Ohio

# NORWESCO PRODUCTS

The sale of up-keep material represents your best opportunity. Read how it hooks up with your business.

This coupon for your convenience. Fill it out and send it in—to-day.

Northwestern Chemical Co.,  
Marietta, Ohio.

Gentlemen: Please send a copy of your handbook "Hook-up" to

Name.....

Address.....

# GATES HOSE

*"The Standardized Radiator Hose"*



Marked by Inches  
Easily Cut to Length

3½ miles of Gates  
Vulco Hose packed  
and shipped every day  
—this gives an idea  
of the demand for the  
radiator hose with the  
tougher rubber lining.

Made by the World's Largest  
Manufacturers of Fan Belts.



# Our advertising

## [is sending radio buyers to *your* store]

**Still Better**  
New Crosley Radio Receivers

THAT Crosley Radio Receivers have given complete satisfaction in the past is evidenced by the fact that during the past twelve months, the Crosley Radio Corporation produced more receiving sets than any other manufacturer in the world. That the new line of Crosley instruments, illustrated herewith, will give even better service is assured by the exhaustive tests to which each model has been subjected both in our laboratories and in actual use under all weather conditions.

Each Crosley Model is designed to give the utmost efficiency at the lowest cost and as you may start with a small receiver and as you desire, add to it to increase its range and volume.

Starting with the one-tube Crosley 50 for \$14.50 you can add the ten stage Amplifier for \$10.00 and have a three tube receiver for \$24.50. Or, the Crosley 51 for \$18.50, or the Crosley 52 for \$30.00, if you add the three tube amplifier for \$10.00 you have the Crosley 52 for \$40.00. Or you can pay much higher prices for radio receivers. But we have yet to add one at

**THE CROSLLEY RADIO CORPORATION**  
140 Alfred Street  
Cincinnati, Ohio

**CROSLLEY**  
Better-Cost Less  
Radio Products

MAIL THIS COUPON TODAY  
The Crosley Radio Corporation,  
Cincinnati, Ohio—Please send me the new line of Crosley Radio Receivers and parts together with booklet entitled "The Story of Radio".  
Name \_\_\_\_\_  
Address \_\_\_\_\_

**Every Radio Publication**

Full page advertisements of the Crosley line have been consistently appearing month after month in all the Radio Magazines and other publications. The illustration here shows July's full page in the Saturday Evening Post featuring the new line of Crosley Receivers. This same advertisement will run through the entire Crosley schedule.

**More Crosleys Sold Last Year  
Than Any Other Radio Receiver  
in the World**

The Crosley 51, at \$18.50, was a record breaker, selling at a thousand a day in less than a month. The Crosley Trirdyn 3R3, at \$65.00, was a surprise to radio experts all over the country. They reported—"best receiver on the market regardless of price." The Trirdyn 3R3 Special is a DeLuxe model at only \$75.00. The Model 50, a one tube marvel, sells for only \$14.50, and the 52 with three tubes for \$30.00. The Crosley Portable at \$25.00, all self-contained, we believe is superior to any other portable offered at anywhere near the price. All of these sets are licensed under the Armstrong U. S. Patent No. 1,113,149.

**You Should Carry the New  
Crosley Line**

If you are selling Crosley Radio Receivers and know their quick turnover and customer satisfaction—then see that you carry this full new line. If you are not handling Crosley Radio Receivers, you have a profitable opportunity now open to you. Get this new Crosley line. There is a Crosley Receiver to satisfy every pocketbook and preference.

For Sale by Good Jobbers Everywhere

**THE CROSLLEY RADIO CORPORATION**  
Powel Crosley, Jr., President  
6534 Alfred Street Cincinnati Ohio  
Crosley Owns and Operates Broadcasting Station W.L.W.



*THIS book is part of the USL Complete Merchandising Plan. It answers every vital business question of the Battery Distributor.*

## The Answer to the "Charge for Service" Question

USL has solved the "charge for service" problem once and for all. The USL Recorded Inspection System gives the car owner a really worthwhile service which he cannot get elsewhere. He will gladly *pay* for testing and inspection under this exclusive USL System which is explained in detail in the new USL Manual.

When you sign up as a Distributor with USL your success is *assured*.

You are given a definite, workable plan of operation that shows you how to increase your business and how to avoid the serious leaks and losses that cut into your profits.

You get the benefit of expert advice and assistance in *every* branch of your business.

Write TODAY for full particulars of the USL Merchandising Plan and what it means to YOU. It will open your eyes to the greatest money-making opportunity in the battery business.

—Fill out and mail—

Date.....

U. S. Light & Heat Corporation  
Niagara Falls, N. Y.

We would like to know more about the new USL Battery Merchandising Plan. Please have your representative call and explain the new plan in detail. We understand this places us under no obligation.

Name .....

Address .....

City .....

State .....

We <sup>(do)</sup><sub>(do not)</sub> handle and service batteries.

U. S. Light & Heat Corporation, Niagara Falls, N. Y.

USL Pacific Coast Factory  
Oakland, Calif.

USL Canadian Factory  
Niagara Falls, Ontario

USL Australian Factory  
Sydney, N. S. W.

*storage* **USL** *batteries*



# Ten Reasons Why You Should Prefer—



*for Economical Transportation*

- 1 ***Chevrolet is modern in appearance.*** All models are of stream-line design, and fine, durable finish. Closed models have genuine Fisher Bodies.
- 2 ***Chevrolet is modern in construction.*** It has standard sliding gear transmission, Remy electrical equipment, modern cooling system, suction fuel feed with tank at rear, demountable rims, safe steering mechanism—in fact all essential engineering improvements found in the highest priced cars.
- 3 ***Chevrolet is fully equipped as sold.*** We quote prices on *complete* cars only. Chevrolet is all there, ready for use as soon as you put on your license plates. Compare the fully equipped Chevrolet with other cars, plus their missing equipment, and satisfy yourself which costs less.
- 4 ***Chevrolet transportation averages less cost per mile*** than that of any other car at any price. This cost includes the list price of car, insurance, operation, maintenance, annual depreciation, and interest on your investment. Why pay more per mile for lower quality?
- 5 ***Chevrolet has the most powerful motor*** of any low priced car. Its supremacy for hill climbing and hard going is well known. *Where there are most hills there are most Chevrolets.* Why drive a slow car and hold up the line when it costs less to be a leader?
- 6 ***Chevrolet yields solid comfort in riding.*** This is due to its long wheel base, correct body suspension on extra strong and resilient vanadium steel springs, well-sprung and padded upholstery, deep seats with ample leg room, and correctly inclined backs. The double ventilating windshield and cool motor make driving a pleasure instead of a discomfort.
- 7 ***Chevrolet service costs are low*** because so few hours per year are needed in service stations. Chevrolets are built to stay together, and do not require the people who buy Chevrolets from you to be always near a service station.
- 8 ***Chevrolet is a quality car.*** People are proud to tell of their ownership of a Chevrolet. Their Chevrolet tells the world that they appreciate modern quality and are good judges of value.
- 9 ***Chevrolet is built for safety.*** It steers firmly and easily and the steering gear will not lock itself. It holds to the road even at high speed on gravel. Its braking power is ample. It is easy to handle and accelerates so quickly it enables you to get out of a bad position promptly. It is one of the few cars granted Class A rating by insurance underwriters.
- 10 ***Chevrolet is easy to buy and easy to trade.*** In buying a home, people always consider what they would get for it if they ever wanted to move. The wise motor car buyer nowadays has an eye for trade-in values in considering his purchase of a car. He thinks of the time that will arrive when he wants to buy a new car when he wishes to make a good trade-in deal. Chevrolet trade-in value is high because of this well-built, long-lived automobile.

*There are many other reasons for the Chevrolet franchise being today the most valuable any dealer can get. We will be glad to consider applications for dealerships in territories in which we are not represented.*

## CHEVROLET MOTOR COMPANY, DETROIT, MICH.

*Division of General Motors Corporation*

*Prices f. o. b. Flint, Michigan*

Superior Roadster . . . . .	\$495	Superior 4-Passenger Coupe . . . . .	\$725
Superior Touring . . . . .	510	Superior Sedan . . . . .	795
Superior Touring DeLuxe . . . . .	640	Superior Commercial Chassis . . . . .	410
Superior Utility Coupe . . . . .	640	Utility Express Truck Chassis . . . . .	550



**Q**UIET operation has always been one of the outstanding features of Hyatt Quiet Roller Bearings. And now, in the Hyatt New Series Bearings, this distinctive and highly desirable feature is even more pronounced.

The quiet performance of motors, axles and transmissions equipped with Hyatt New Series Roller Bearings, contributes very materially to the lasting quiet performance of the cars in which they are used.

Manufacturers are better able to meet the requirements of consistent quiet operation through the use of Hyatt Quiet New Series Roller Bearings for supporting shafts and gears.

**HYATT ROLLER BEARING COMPANY**

NEWARK    DETROIT    CHICAGO    SAN FRANCISCO  
HUNTINGTON, PHILADELPHIA, PITTSBURGH, MINNEAPOLIS  
WORCESTER, BUFFALO, CLEVELAND, MILWAUKEE

*The  
New Series*

**HYATT**  
*Quiet*  
**Roller Bearings**



# Let this "Ask 'em to Buy"



SHALER SELF-MERCHANDISER  
FREE—with an order for one dozen  
or more Shaler Vulcanizers

## It will triple your sales

This attractive Self-Merchandiser, with its demonstration of the Shaler outfit, its simple operation, and a sample vulcanized repair, is a profitable silent salesman. Every Vulcanizer sold means a repeat customer who will come back month after month for more Shaler Patch-&-Heat Units and meanwhile recommends the Shaler to his friends.

This repeat business on Shaler Patch-&-Heat Units pays you a good profit. The motorist who has once used the Shaler never goes back to the old-fashioned stuck-on patches. More than two million motorists use it.

## Saturday Evening Post "Tie-Up"

Many of your own customers are reading our advertisements in the Saturday Evening Post, and other national publications, motorist magazines, and farm papers. Tell them you sell the Shaler. Write for our attractive new window display. Put the Self-Merchandiser on your counter while your customers are reading our advertisements.

C. A. SHALER CO., 211 Fourth St., Waupun, Wis.

## How Dealers Can Get It

All you need do is to give your Jobber's salesman an order for one dozen Shaler Vulcanizers and ask for Free Self-Merchandiser.

It is made of hardwood, ebony finish, with four-color metal front 9 x 14 inches. It is also a compact container and holds a dozen vulcanizers.

## Next Best Thing to a Personal Demonstration

It shows a real vulcanizing outfit. The simple method of operation is made plain by pictures. A real 5-minute repair, vulcanized on a section of inner tube, so that your customers can examine it and compare it with other methods of patching. It is the next best thing to a personal sale.

Get it from Your  
Jobber's Salesman



## Install Lubricating Service

Now—Complete Alemite Service Equipment  
as Low as \$200

**T**HE cost of installing Alemite chassis lubricating service is less than the cost of your *free* air. And it brings in even more new business.

"In the month of December," writes Mr. Weiner, Manager of the House That Jack Built, "we were one of the very few filling stations in Milwaukee to increase their gallonage. I sincerely believe this increase is directly traceable to the fact that I installed Alemite Lubricating Service."

Alemite advertising makes this possible. Over 4,000,000 cars are now Alemite-equipped. All you have to do is put up the Alemite Service sign to get the attention of every other motorist (Fords excepted) who passes your place.

With an Alemite Lubricating Service Outfit one man costing you 75 cents per hour (or less) can bring in \$4.50 per hour. If he only lubricates 3 cars! Deduct cost of materials, wages, etc. Your *net* profit is \$3.00 per hour. And in most cases your present help can handle the service in addition to present work.

### Read What Others Are Doing

G. P. McIntyre, of Chicago, says: "One man with a 2-car rack costing \$100 ought to make over \$5,000 a year."

"We serviced about ten cars a day when we started in 1919. Now we handle from four hundred

to five hundred a day."—Washburn-Walker Co., Inc., Los Angeles.

"Our business grew from a few cars to fifty-two cars a day. We started with nothing but a rack, a compressor and a barrel of grease."—Universal Lubricating System, Portland, Oregon.

"Our great problem now is more room. We get much of our work from fellow dealers. We are looking about for more station locations."

—Lubrication Service Co., Denver.

"My rack cost me only \$40. Without a helper I make \$5,000 a year and more. With each helper I hire, the rate of profit is 30% to 40% more."

—R. L. Perkins, Chicago.

"I had only \$200 when I started. I service only Alemite-equipped cars. I am figuring on several more stations."

—Lowry Lubricating Service, Pasadena, Cal.

### Then Investigate

Send today for this Free Book, "How to Go into the Lubricating Service Business." It is the only complete text book on the fastest growing business in the motor field today.

Gives costs, plans, profits. All you need to know to make this side line pay you profits of \$50 to \$200 per week on an investment as low as \$200. (Large stations pay 4 to 5 times as much). Just mail the coupon today. No obligation.



THE BASSICK MANUFACTURING COMPANY  
2662 North Crawford Avenue, Chicago, Ill.

A Bassick-Alemite Product

**ALEMITE**  
High pressure lubricating system.  
"Reg. U. S. Pat. Off."

THE BASSICK MFG. CO.,

2662 N. Crawford Ave., Chicago, Ill.

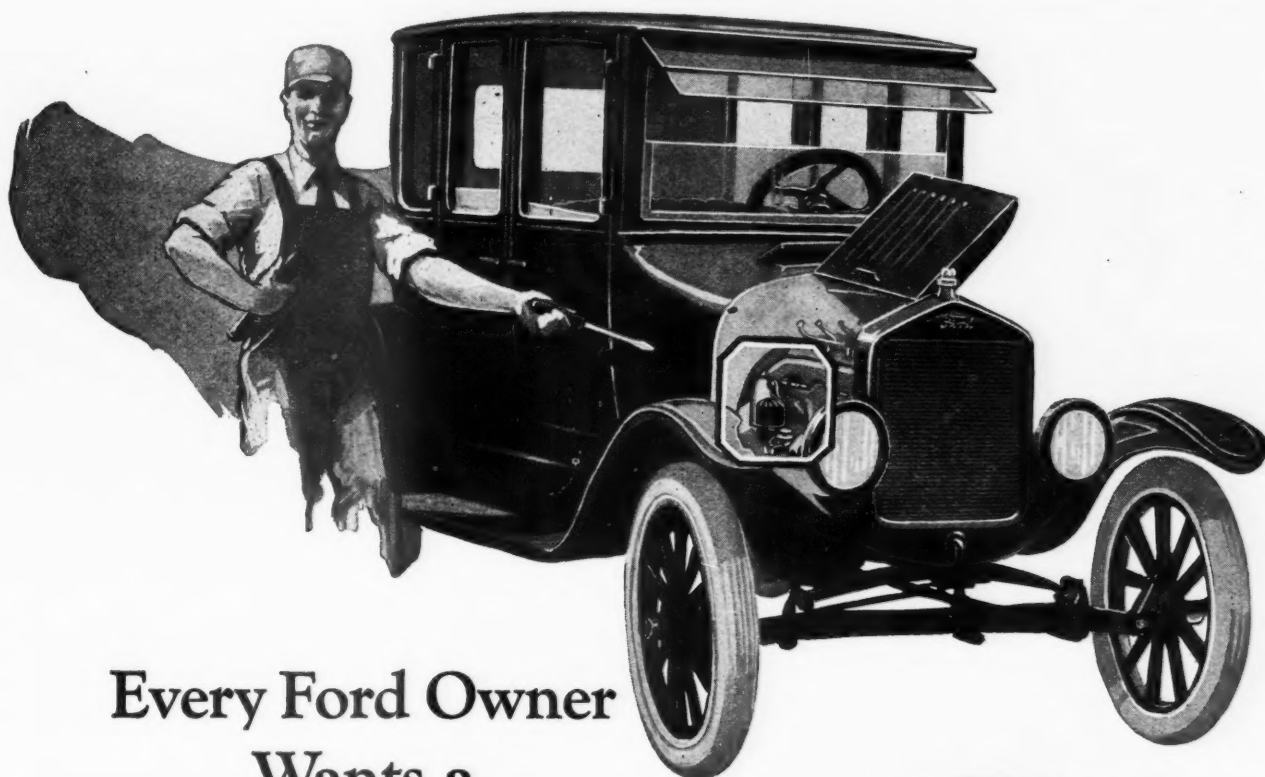
Please send me, without obligation, your free book, "How to Go into the Lubricating Service Business."

NAME.....

ADDRESS.....

CITY..... STATE.....





## Every Ford Owner Wants a United Air Cleaner You Can Make the Profits

**F**ORD owners are welcoming this new necessary accessory. And why shouldn't they? The United Air Cleaner, by preventing dirt, sand, dust and grit from being sucked into the motor eliminates much of the wear on cylinder walls, piston rings and bearings. Oil lasts longer, repair bills are cut and motor runs smoother. It can be attached to any Ford in less than five minutes; it is absolutely automatic in operation; requires no attention—not even oiling—and will outlast the car.

The United Air Cleaner for Fords sells for \$5.00 retail—other cars slightly higher. The discount to dealers is very attractive. May we send you further information? It will not obligate you in the least. Just fill out the coupon—you can cash in on this opportunity.

UNITED MANUFACTURING & DISTRIBUTING COMPANY  
9705 Cottage Grove Avenue, Chicago, Ill.

Wm. E. Kemp, 245 W. 55th St., New York City  
New York and New England Distributor

# The UNITED AIR CLEANER

"Dustless Air to the Motor"



United Air Cleaners are made to fit all makes of cars, trucks or gasoline motors. Every car in your community is an opportunity for you to make an Air Cleaner sale.

United Manufacturing & Distributing Co.  
9705 Cottage Grove Avenue,  
Chicago, Ill.

Gentlemen:

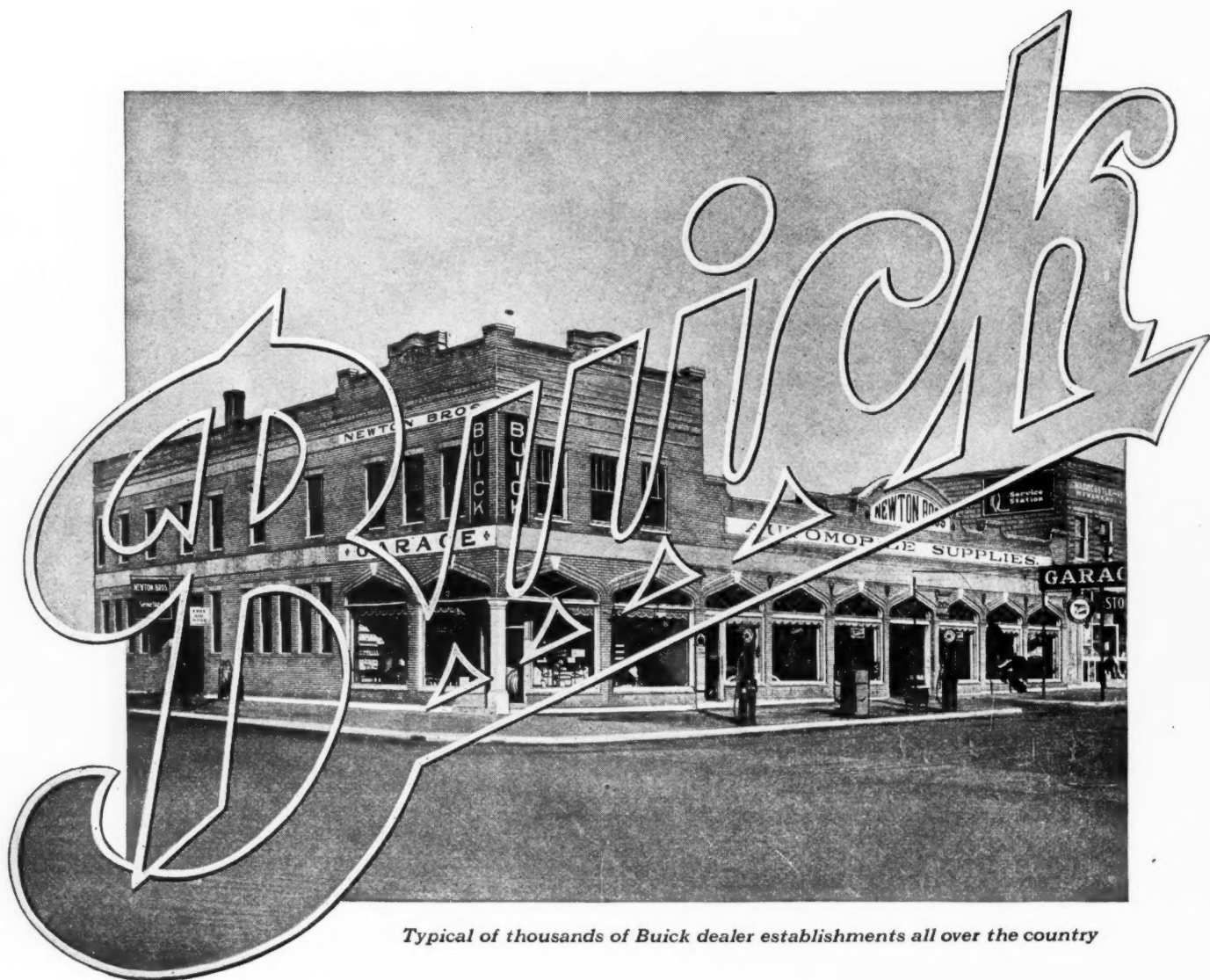
Please send me particulars of your dealers' proposition on United Air Cleaners.

Name.....

Address.....

Business.....

M. A. 7-26



*Typical of thousands of Buick dealer establishments all over the country*

**I**N 1923 Buick sold over 73,000 more cars than any other manufacturer of high grade automobiles. Easy to see why live automobile dealers are always anxious to get a Buick franchise—why Buick dealers remain Buick dealers year after year. Why not have your name on file?

**BUICK MOTOR COMPANY, FLINT, MICHIGAN**

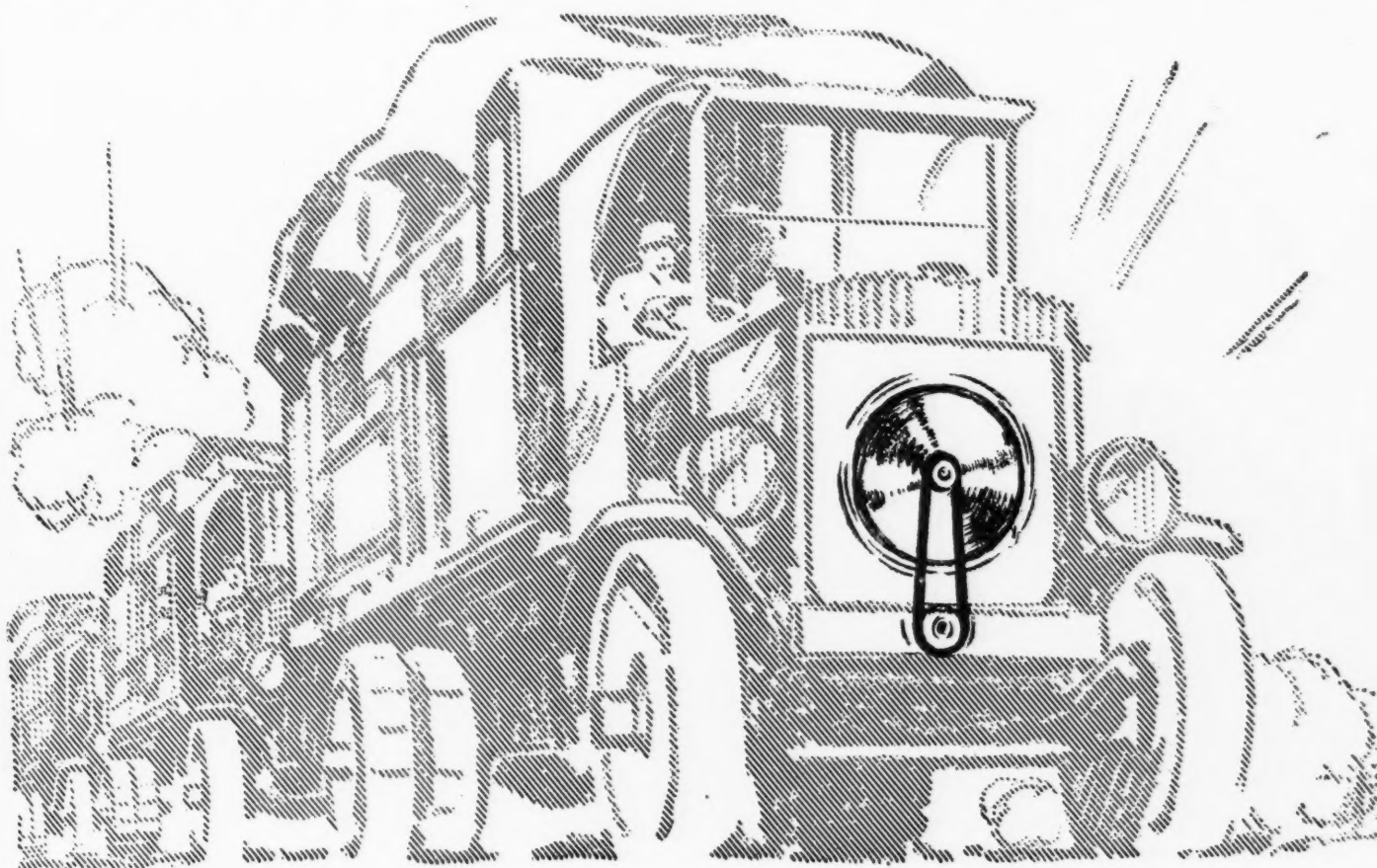
*Division of General Motors Corporation*

Pioneer Builders of Valve-in-Head Motor Cars

Branches in All Principal Cities—Dealers Everywhere

**WHEN BETTER AUTOMOBILES ARE BUILT, BUICK WILL BUILD THEM**





## The Test of Hard Service

The true test of a fan belt is the rough wear and hard service of truck use. Where the oil, dirt, water and grease all have the best chance to weaken and tear it apart.

Rie Nie Fan Belts stand up under these trying conditions as no other belt can. Where dependability means everything, where an overheated engine means costly delay, here is where Rie Nie Quality is fully appreciated.

That is why dealers everywhere always insist upon Rie Nie Quality.

Vee Round for grooved Pulleys. Flat Type for regular or Crowned Pulleys.

**DURKEE-ATWOOD CO.**  
MINNEAPOLIS, U.S.A.

## *Rie Nie* Automotive Products

All in One Dressing  
Aluminum Enamel  
Battery Paint  
Bearing Blue  
Clutch and Brake  
Compound  
Enamel (Air Drying)

Enamel (Cylinder)  
Fan Belts  
Friction Tape  
Gasket Cement  
Graphite  
Polish—Auto Body  
Radiator Cement

Orange Shellac  
Radiator Hose  
Rim Paint  
Rubber Cement  
Shellac (Gasket)  
Rubber Filler and  
Cement

Spring Lubricant  
Tire Mica and Tire  
Talc  
Leather Dressing  
Metal Polish and  
Nickel Polish

Patch  
Pedal Pants  
Tire Paint  
Valve Grinding  
Compound  
Varnish (Clear Auto)

# LYON AUTO PARTS CONTROL



## *Replacement Parts for 15,000,000 Motor Cars*

More than fifteen million motor cars will need replacement parts and accessories this year—a tremendous business that will be done entirely through dealers.

Are you organized to get your share of this business and earn maximum profits?

Lyon Auto Parts Control Systems are designed to help you do this. Everything that a dealer needs for stock keeping is included in the Lyon line—shelving, display counters, tire racks, wheel and rim racks, fender

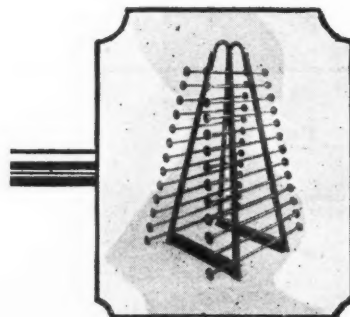
racks, spring racks, radiator racks, tool boxes, wardrobe cabinets, stationery cabinets, lockers and other products.

No matter what your requirements are there is a Lyon Auto Parts Control System designed for your individual needs by the largest manufacturer of steel shelving.

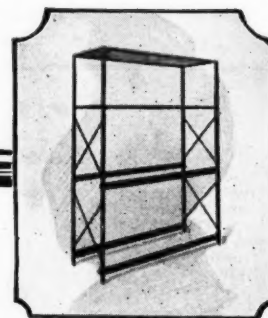
You can get complete information from leading automotive jobbers or direct from us. We will be glad to hear from you.

## **Lyon Metallic Manufacturing Company** **Aurora / Illinois**

Lyon Auto Parts Control Systems are sold by  
leading Automotive Jobbers



*for Every Storage Need*







Imagine a radiator that would dwarf the Woolworth Building! Yet a single month's output of Harrison Radiators rolled into one would do it.

# HARRISON RADIATORS

HARRISON RADIATOR CORPORATION, LOCKPORT, NEW YORK



THE MARK OF RADIATOR SATISFACTION



## You can turn that "morgue" into cash, Mr. Jobber!

Don't tie up your capital in big inventories. Get rid of that "morgue" in your store or warehouse and have more capital as well as space for items which have a ready sale *in your territory*.

All the accessories, parts, equipment for which there is no local demand you can sell at a price that will make their clearaway *profitable*.

Someone somewhere wants to buy those items you want to sell. And he, in turn, may have something you would be glad to buy "at-a-price."

The more than 80,000 readers of Motor Age, Motor World and Automobile Trade Journal are the active dealers, jobbers and garagemen—and excellent prospects for just those things you want to sell. You can reach these progressive, prosperous prospects through a Broadcaster advertisement.

You can afford Broadcaster advertising. The cost is slight. Undisplayed ads are 6c a word in Motor Age or Motor World; 10c a word in the big monthly Automobile Trade Journal.

## *The* Broadcaster

**A DEPARTMENT THAT  
WILL FIND WHAT YOU WANT**

For Broadcaster rates in Motor Age, Motor World, Automotive Industries, Automobile Trade Journal, Distribution & Warehousing, address the Class Journal Company, 5 So. Wabash Ave., Chicago, Ill., or 239 W. 39th St., New York.



# Balloon Tires Increase the Demand for

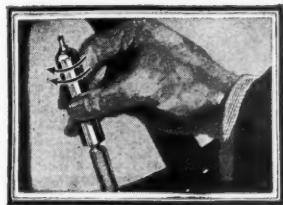
## DILL INSTANT-ON DUST-and-VALVE CAP

**F**IVE pounds loss of air makes a big difference in the service and riding ease of balloon tires. Instant-on seals the valve stem and guards against loss of air.

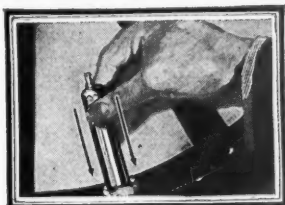
And this Instant-on advantage is in addition to the time and trouble they save in inflating. Proof of the growing demand for Instant-ons by tire and car manufacturers as well as owners is found in the millions of cars now rolling on Instant-on equipped tires.

Dealers everywhere are finding a ready sale for Instant-ons—If your stock is low order from your jobber. Sets of five, packed in individual boxes retail at \$1.00 a set. Twelve of these sets packed in an attractive counter display \$8.00.

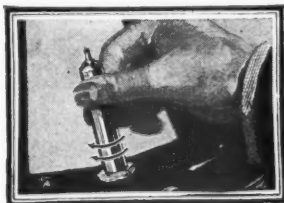
THE DILL MANUFACTURING CO.  
Cleveland, Ohio  
Manufactured in Canada by  
The Dill Manufacturing Co., of Canada Ltd., Toronto



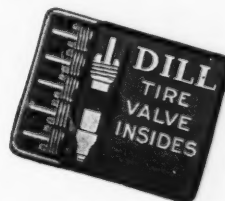
**1** Just catch the cap on the valve stem with one or two turns—



**2** then push down as far as the cap will go—



**3** another turn or two to tighten and it's done.

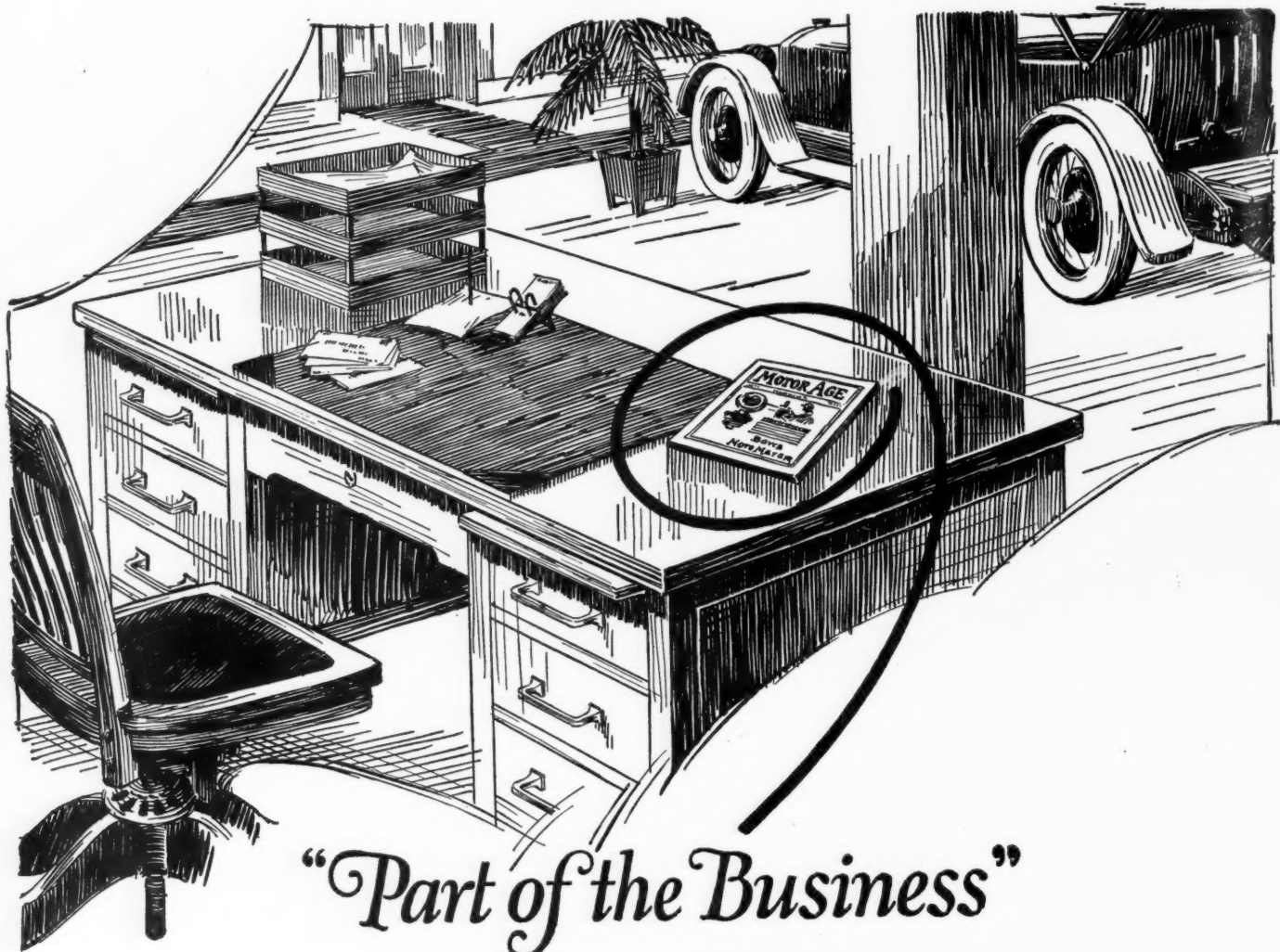


Dill Standard  
Valve Inside

Another quick seller.  
20 of these metal boxes  
containing 5 insides  
each are mounted on  
a beautiful metal dis-  
play stand, litho-  
graphed in colors.  
Boxes retail at 30 cents  
each. Display stand  
costs \$4.20.

# DILL

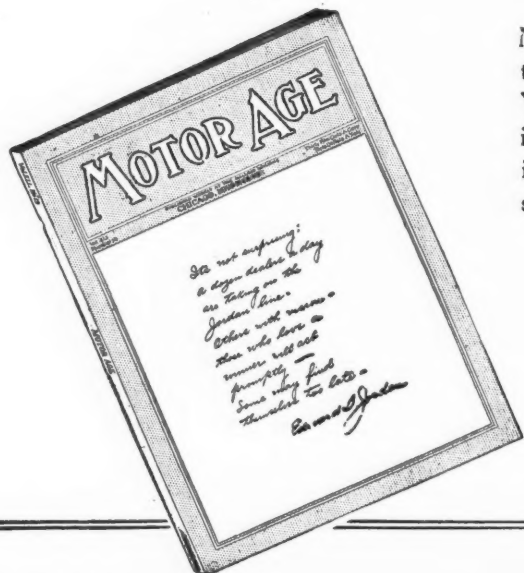
## Tire Valves and Valve Parts



## "Part of the Business"

**I**F an automotive merchant could travel through the country asking hundreds of other automotive merchants about their methods of doing business—if he could find out why some businesses have failed and others prospered—if he could hear the personal stories of success from the acknowledged leaders of the automotive trade—if he could do this he would return home a far broader man and a more progressive dealer than when he started. His mind would be filled with new ideas. His enthusiasm would be kindled. And his business would reflect the valuable lessons learned.

MOTOR AGE is making such a trip possible to thousands of automotive merchants the world over. Yet these men need never leave their desks, for in its columns MOTOR AGE presents information of inestimable value gathered from every conceivable source.



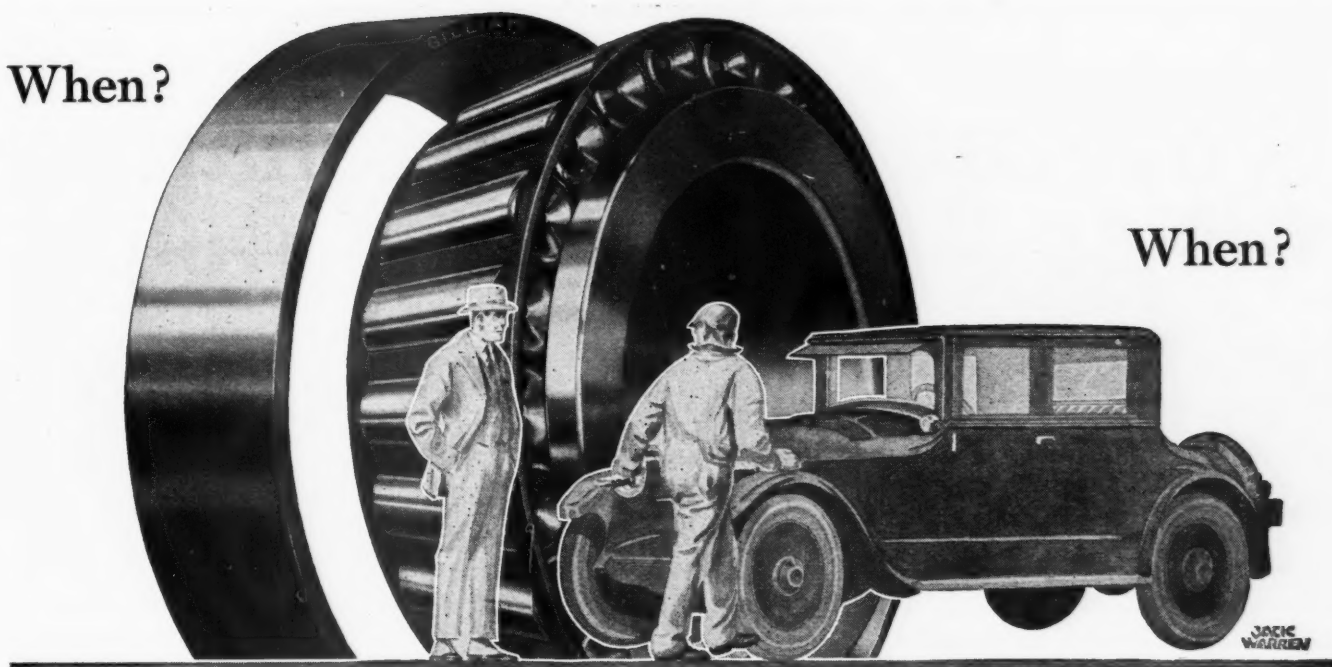
# MOTOR AGE

5 S. Wabash Ave.

Chicago, Ill.



When?



When?

## When can I get it?

That's the question the car owner asks when his car needs a bearing replaced. Speedy action to keep your promise and make a satisfied customer is assured by Gilliam Distributors at accessible points throughout the country. With their complete stocks of Gilliam Tapered Roller Bearings they give you instant service.

The arrow symbol signifies the recognized ability of Gilliam Tapered Roller Bearings to carry all combinations of radial and thrust loads from all directions.

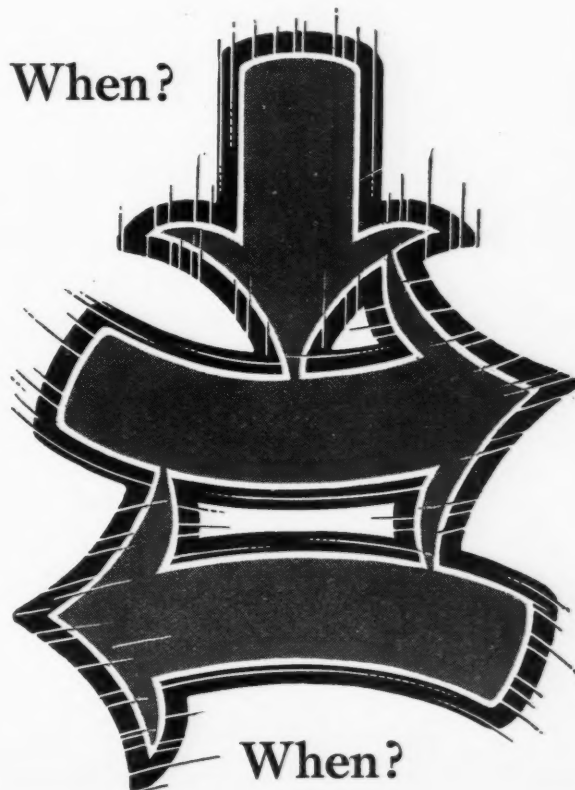
They are used as standard equipment in 74 makes of passenger cars and trucks.

Gilliam Bearings are made of high grade alloy steel.

Furthermore, because Gilliam Tapered Roller Bearings are made in a multitude of sizes which are interchangeable as complete units with other makes of Tapered Roller Bearings, as well as certain sizes of ball bearings—your market for Gilliam Replacements is large and your opportunity for profits great.

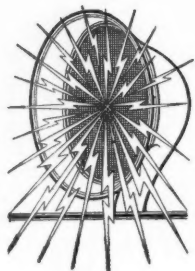
Be the local Gilliam Bearing man. If you don't know your nearest Gilliam Distributor—write us direct.

The Gilliam Manufacturing Company  
Canton Ohio



When?

# You can sell or exchange that slow-moving stock



Accessories, parts, equipment for which you have no local demand may be just what someone in another part of the country needs—and will buy. The other fellow may have something you want and the exchange can be made without a cash outlay.

Exchange what you can't sell for what you *can* sell. You will increase your profits. You will eliminate all possibilities of a morgue in your store or warehouse. You will have increased capital as well as space for those things which you can sell.

The more than 80,000 readers of Motor Age, Motor World and Automobile Trade Journal are the progressive, prosperous dealers and garagemen of this country. Your advertisement in any or all of these papers will reach the worth-while men in this business. It will span the distance between you and your prospects, however far away.

For 6c a word in the Broadcaster Department, you can tell your sales story to the readers of Motor Age or Motor World. For 10c a word you can reach the 40,000 readers of the big monthly Automobile Trade Journal.

## *The* Broadcaster

**A DEPARTMENT THAT  
WILL FIND WHAT YOU WANT**

For Broadcaster rates in Motor Age, Motor World, Automotive Industries, Automobile Trade Journal, Distribution & Warehousing, address the Class Journal Company, 5 So. Wabash Ave., Chicago, Ill., or 239 W. 39th St., New York.





## There Is One Best Cable for Every Automotive Job

For over thirty-three years we have been concentrating here in Jonesboro on the one problem of making good cable. And, in these days when many are tempted to lower quality where it is difficult for the uninitiated to discover it, you can still be certain that

**IF IT'S PARANITE IT'S RIGHT**

Good dealers and service stations everywhere recognize the fact that we will not lower our standard. Consequently they continue to order PARANITE from their Jobbers—and volume business enables us to hold the price of this quality product lower than would be expected.

*Ask your Jobber for  
"PARANITE" CABLE*

He either carries "PARANITE" or can get it for you. He knows that nothing he could sell you would serve you so well.

*Be satisfied with nothing  
but the best*

## Indiana Rubber & Insulated Wire Company

A. J. Musselman  
549 W. Washington St.  
Chicago, Illinois

Jonesboro, Indiana

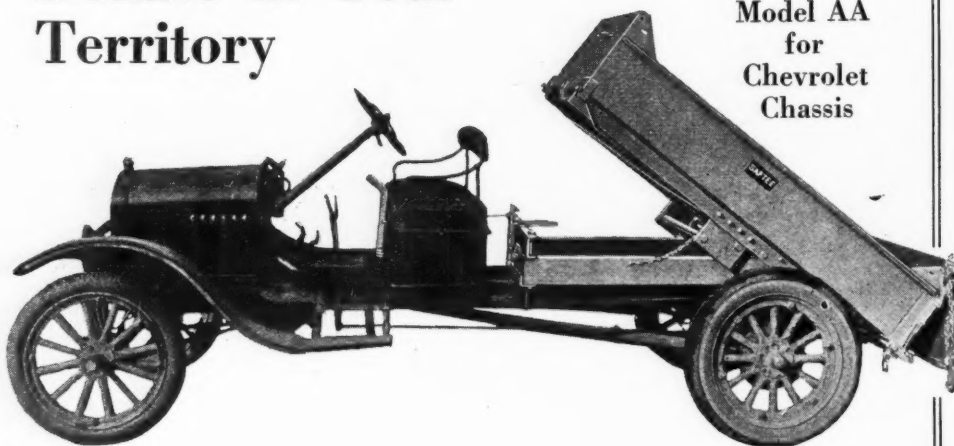
Geo. R. Hall  
West Hartford, Conn.



## Get the + Dollars in Your Territory

## Model TA for Ford Chassis

Model AA  
for  
Chevrolet  
Chassis



There are prospects in every territory that are looking for efficient hauling equipment that is inexpensive.

You can sell the Saftee Automatic Dump Body for use on Ford and Chevrolet chassis or install it on the chassis you sell and make an added profit. It requires no special reconstruction or expense to install. Four "U" bolts do the trick.

The Saftee Body operates by gravity, BUT—unlike other types, the "slam bang" has been eliminated and the chassis is safeguarded against destructive jolts.

The Saftee is built of 10 gauge blue annealed steel, electrically welded throughout, and reinforced with steel angles.

Capacity, one cubic yard. Provision is made for side boards which increase the capacity.

A sand-tight tail gate operates from the top or from the bottom automatically as the body dumps, leaving an 18-inch clearance. It locks automatically to the body and prevents rattling.

Write today for the discount and distributing plan.

**THE DITWILER MFG. CO.**

Galion, Ohio

*Mnfrs. also of Hand Operated Dump Bodies*

When dumping, the center of gravity remains the same because the load is carried on three successive bearing points which take up the momentum, as the body discharges the load. By absorbing the momentum in this way the load leaves the body in a steady sweep and the body arrives at the full dumping position with the same speed at which it started—it does not wind up with a "bang" and rack the chassis.

Relieved of the load, the body is now balanced so that but little more than a touch will return it to the horizontal position. A retroaction of the pivoting points eliminates the "bang" on the return.

In the loading position the body is held securely in place to prevent accidental tipping—rattle or bouncing on the road.



## FREE Advertising and GOOD WORK SUITS

You can advertise your name all over town at no cost to you whatever. Simply have your men wear BETTER'NALL Work Suits. Costs less than overalls. We put on your trade mark or emblem FREE on every suit. Order as many as you need direct from factory and sell to your men at wholesale prices. They get the benefit of factory prices. You advertise your business without cost.

**BETTER'NALL Work Suits** will outwear any overalls. Made of finest materials. Wear guaranteed. Stitches reinforced. Buttons covered. Pockets have flaps and reinforced. Built for comfort. Especially roomy in seat. Made in khaki, blue, white, or blue and white striped materials. Caps made to match.

**SAMPLE SUIT ON APPROVAL:** A sample suit will convince you of the quality and durability of BETTER'NALL Work Suits. Send your trade mark. We will put it on a BETTER'NALL in any color cloth you choose—blue, black, red or white. In front or back. Give size and color suit you want. Your money refunded if you are not perfectly satisfied.

**AUTOMOTIVE GARMENT CO.**

709 Wyandotte St., Kansas City, Mo.

# Better'nall

## WORK SUITS

### At These Low Factory Prices

2 to 6 Garments each	\$ 3.50
12 Garments for	39.00
25 Garments for	78.00
50 Garments for	150.00
Caps to match	
2 to 6 Caps, each	50c
12 Caps	\$4.50

On order for less than six, please enclose remittance or permit us to send C. O. D.



ROYAL BLUE

MAROON

BROWN



CANARY

IVORY

SEA GREEN

## Show Your Colors

Distinction is cornered by Monogram New Color Shields. Here is all the old Monogram beauty *plus* rich color shields, popular emblems and special initial combinations.

Customers are fascinated by this variety of special shields to choose from at slight extra charge. You reap an added profit, as well as good will, on each special shield. But there is no extra stock to carry. All you need is the Monogram Order Book for Special Finish Shields, supplied only by your Monogram distributor.

Ask for full information while Monogram demand is at new heights through the touring season. Monogram theft-protection for the heat indicator and Monogram convenience sell extra strong to the tourist.

GENERAL AUTOMOTIVE CORPORATION  
600 West Jackson Boulevard • • Chicago

**MONOGRAM**  
**ORIGINAL**  
SELF LOCKING RADIATOR CAP

## A life long tool for reaming perfect holes



The bevel blades  
are easily interchangeable

Always a good cut-  
ting edge for  
quick, accurate  
work.

You'll find  
"SURE-MIKE"  
the most perfect  
tool that you ever tried  
for reaming smooth, ac-  
curate holes.  
You'll like the beveled edge for  
pilot in the first cut, the ease with  
which it reams a perfect hole, works  
without chatter, and stands the gaff of  
steady service.

Registered U.S. Pat. Off.  
**SURE-MIKE**  
STAFF  
**EXPANSION REAMER**

The absolute-  
ly straight  
blades insure  
accurate cut-  
ting edges for  
lead. The  
wide range of  
expansion, sim-  
plicity, ease  
of adjustment  
and clean  
shearing ac-  
tion mean  
quick work  
and also  
"SURE-  
MIKE"  
precision.

Set No. 1 con-  
sists of 8  
complete  
Reamers.  
Sizes A to H.  
Reams holes  
from 15-32"  
to 1 1/16"  
inch. List  
price .... \$39.80



"SURE-  
MIKE"  
Reamers are  
improved six-  
blade expan-  
sion type.  
Blades are in-  
terchangeable.  
Made of care-  
fully tested  
steel and ma-  
chined under  
most exacting  
specifica-  
tions and a  
rigid inspec-  
tion.

Set No. 2  
consists of  
4 complete  
Reamers  
Size I to  
L. Reams  
holes 1 1/16  
inch to  
1 25-32 inch.  
List price  
..... \$36.50



### J. WADSWORTH STAFF

Executive Offices:

643 McCormick Bldg. 332 S. Michigan Ave., Chicago

Atlanta Office: E. H. Baughman, 816 Bona Allen Bldg., Atlanta, Ga.; Detroit  
Office: Detroit Eastern Sales Co., 47 E. Canfield Ave., Detroit, Mich.; San  
Francisco Office: Wentworth-Fischer Co., 709 O'Farrell St., San Francisco, Cal.

## Willys-Overland, Inc. Denver, Colo.

Gentlemen:

Acknowledging your letter asking us  
to run our ad for additional weeks, it  
will not be necessary as we have now  
received so many replies from the first  
insertion, we have been able to take care  
of the enlarged organization we planned  
in a very satisfactory way.

There is no doubt at all that your  
Ads do reach the right people and should  
we have occasion to still further enlarge  
our organization, we will let you run an-  
other ad for us.

WILLYS-OVERLAND, INC.  
FRED S. ANDREWS  
Branch Manager.

### TERRITORY ORGANIZERS WANTED

Have openings in our field organization for territory  
development men preferably with retail experience  
on Overland, Ford, Chevrolet or Dodge cars. Wire  
or write giving age, earning capacity, merchandis-  
ing experience during the last five years. State  
whether married or single.

BRANCH MANAGER,  
Willys-Overland, Inc. Denver, Colo.

## "many replies" to this ad

And three weeks after above letter was  
written the company said: "We are still  
receiving replies, which is proof that  
your advertisements certainly do reach  
the man who is looking for a job."

Broadcaster Service covers all your busi-  
ness wants. Whether it's finding help or  
employment, agents or agencies, salesmen  
or accounts, buyers or sellers of used ma-  
chinery, equipment or surplus bargain  
stocks, a Broadcaster ad will give you  
contact with your best prospects.

Broadcaster ads are inexpensive. The ad  
shown above cost but \$4.50. Undis-  
played ads, 6c a word.

## The Broadcaster

A DEPARTMENT THAT  
WILL FIND WHAT YOU WANT





## It Pays to Buy a Kellogg

Model  
EM 62  
Air Compressor



## The Big Boy

The Kellogg EM 62 is a big, sturdy compressor built for a big place just like yours.

It will always give you all the good, clean air you need—when you need it. Never falls down on the job.

We can prove it too—just send us a card.



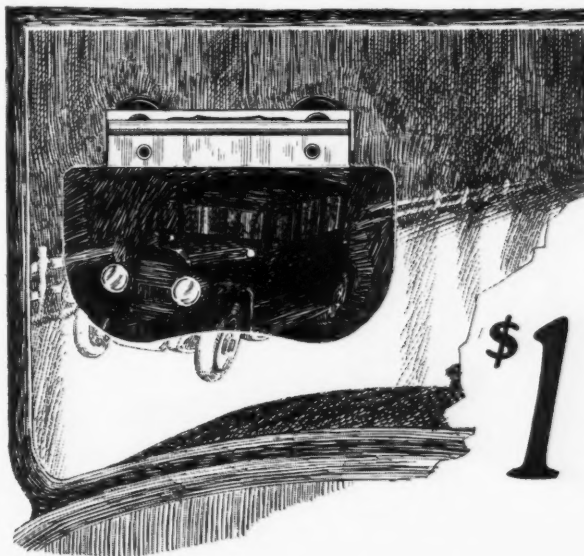
New Kellogg  
Air Tower

Attracts Motor-ists day and night. Air and water service combined. Price only \$60.00 net.

**Kellogg Mfg. Co.**  
Rochester, N. Y., U. S. A.

NEW YORK	CHICAGO
105 West 63rd St.	1502 Monadnock Bldg.
SAN FRANCISCO	
1583 Bush St.	
CLEVELAND	DALLAS
1108 Hippodrome Bldg.	2006½ Commerce St.

**Beyond Compare for Pumping Air**



## Kills the Glare

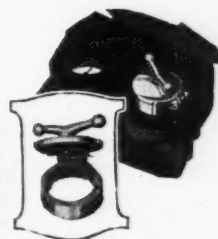
(Just stick it on the glass)

Biggest dollar's worth you can sell a car-owner. The "Glare Stop" Shield makes night-driving safe.

Just press it against windshield-glass in the line of vision. Its green transparent visor of genuine "Viscoloid" kills the fiercest oncoming headlight glare. The rubber suction-pads make it hold tight indefinitely. Hinged. Flip it up out of the way with the finger. A SPRING holds visor securely at any angle. Aluminum. A very SUPERIOR article. Send for sample, and the name of nearest jobber. Retails for \$1. Liberal discount.

## Hinged-Lid "Neva-Lost" Cap

For gas-tanks. Screw it on PERMANENTLY. Quarter-turn locks and unlocks hinged lid. Ground-cork gasket makes lid TIGHT. Heavily nickeled. Individual cartons. Assortment of 15 covers 70 makes of cars. Counter-Display. Retails \$1.50 each.

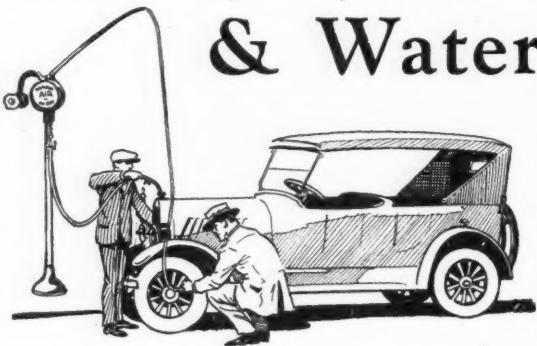


**\$1.50**

**Welco**  
*accessories*

TRADE MARK  
**Welker-Hoops Mfg. Co.**  
Middletown, Ct.

## Money in Air & Water



Why worry, when a Franklin Air and Water Station actually makes free service pay? Here is an outfit that gives real service—clean, quick, convenient! It saves time for you and your employees; it saves time for your customers.

No more greasy water buckets for your customers to carry; no more dirty kinked air hose to handle. Instead, a long, clean air hose that takes air to all four tires and the spare; another hose that, at the turn of the valve, puts water into the radiator.

Your Franklin Air and Water Station will make real friends. People who use it won't want to stop any other place. They'll look for you—and they'll bring you their business. They'll tell their friends about it. The glass encased head of the Franklin is wired for an electric light. The long hose arm, air hose and revolving head makes it possible to serve two cars without moving them. A counter-balance (no springs) drops the hose arm back into place when released—gently and without injury. The Franklin is built for long, hard service.

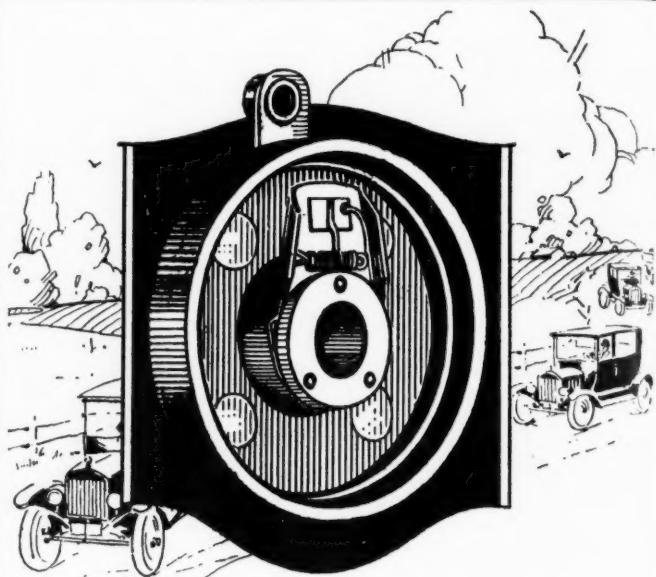
The curb model is \$58.50, while the wall bracket model is \$43.00 with air and water connections, \$38.50 with air only. All prices f. o. b. Norristown. Make your air and water service pay—install a Franklin Air and Water Station. Order today from your jobber, or write us for full particulars.



**Super Single Stage Air Compressor**

Exclusive Franklin design, \$225 f. o. b. Norristown. Write for folder.

**Franklin**  
Air Compressor Works  
2604 Main Street  
Norristown - - - Pennsylvania



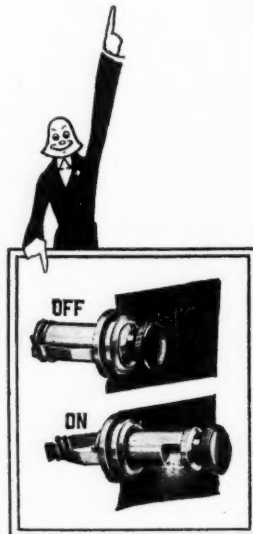
*"Built like a High-Grade Distributor"*

which is one big reason why jobbers report that Bell is becoming their fastest-selling Ford timer.

## The BELL TIMER

Precision made, to give to Fords all the power, smoothness and easy starting of the high-priced car.

1. Wipe contact
2. Copper brush
3. Copper contacts
4. Bakelite shell
5. No oiling



Bell Timer is a fast-moving profit maker which should be on every dealer's counter. Leading jobbers handle Bell Timers.

*Ask your jobber or write us direct.*

*Ask also about the unique BELL DASH LAMP for Fords and other cars. It's out of the way when not in use.*

**Bell Manufacturing Co.**

13 Elkins Street,

Boston 27, Mass.





Here  
is  
**PROFIT!**

**Y**OU can make more money with Graton & Knight Standardized Leather Fan Belts than you ever expected to make from fan belts!

These splendid belts have the honest quality that makes them easy to sell. Your customers can tell from the "heft" and "feel" that Graton & Knight belts give their money's worth in service—and then some!

Made of famous Graton & Knight *standardized leather*. Resist motor heat, oil and water. Tough. Pliable. Grip the pulleys without bearing destroying tension. Hold their shape. You can unhesitatingly recommend them as the most durable, long-wearing belts money can buy. Every time you sell one you make a friend for your business!

Graton & Knight belts are furnished in Flat, "V" and Link "V" types. Made to specifications for every car. *And they pay a mighty generous profit!* Write your jobber to-day for prices and particulars.

THE GRATON & KNIGHT MFG. CO.  
Worcester, Mass.



**GRATON & KNIGHT**  
Standardized  
**LEATHER BELTING**

**"We Are Sure Well  
Pleased With It."**

*Says Doyle  
of Alton, Ill.*  
**You'll Think  
the Same —**



Every Garage, Every Battery Service Station, Every Car Owner—will find **KEY GRAPHITE PASTE** the logical thing to use. Use it and Display it for sale and win profits and friends. Costs you nothing to try it.

Jobber and Distributor Correspondence Invited

**KEY BOILER EQUIPMENT CO., INC.**  
27th and McCasland Ave., East St. Louis, Ill.

**--Sample--FREE--**

Key Boiler Equipment Co.,  
27th and McCasland Ave.,  
East St. Louis, Ill.

Please send me without charge or obligation a sample of Key Graphite Paste.

Name.....

Address.....

Business.....

MA 6-26

## Start Your Season Right—and Early

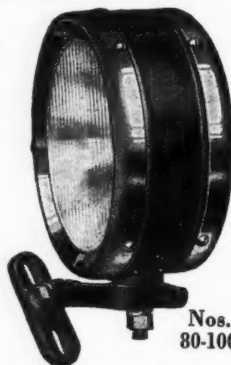


Auto Lamps serve a particular purpose—to satisfy the user with profit to the seller.

You, as a seller, can carry K-D Auto Lamps with a world of confidence. They sell quickly, stay sold surely and bring you satisfactory profit.

Order the three numbers illustrated here for your warm-weather business.

**The K-D Lamp Co.**  
CINCINNATI, OHIO



**Drum Shape Head Lamps**

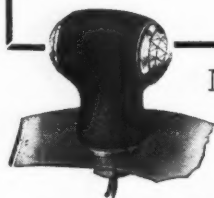
*With Universal Bracket*

Two sizes, 9 in. and 10 in. front diameter. Body is drawn in one piece. All plated parts are brass, highly polished and absolutely rust-proof.

Reflector is parabola shaped brass, highly polished and plated. Single or double circuit.

Finished all nickel or black enamel, baked on, with nickel trimmings.

Both models are supplied with an approved dimmer lens.



**No. 28 Parking Lamp**

Small type Parking lamp, body made from solid casting, top easily removed for replacement of bulbs. To install; drill one hole in fender, fastened underneath with lock washer and nut.

Glasses are cut jewel type, ruby in rear, crystal in front. Lamp does not have self-contained switch, necessary therefore to install separate switch on instrument board.

Bulbs are 2 c.p., 6-8 volt, single wire circuit only. Each lamp is furnished with nut and lock washer for attaching.



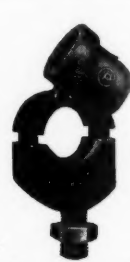
**Three Way Parking Lamp**  
(Same construction as No. 28, with Extra Green Lens on side)



No. 11. Service Type.



No. 12. Cable Type.



No. 13. Takes the place of 4 Elbow Clamp Types.

## WISE Type

### Battery Terminals

*Are just as far ahead of clamp types as balloon tires are ahead of fabrics.*

### Sample Free

One sample and one trial will tell you more about the superiorities of VISE types over clamp types than a dozen books. When writing please give us the names of the houses you buy your Battery replacement parts from.



Ask Your Jobber for "OHIO" Terminals and Battery Equipment

**THE OHIO PARTS CO.**

3301 Colerain Ave., Cincinnati, O.



## GAYLORD LITTLE GIANT Water Saver

An automatic shut-off valve which is concealed in the palm of hand to which can be attached various nozzles, some of which are shown below, and that are used for innumerable purposes.

This is one of the Gaylord Products that simplifies car washing—saving time and money.

WRITE FOR BOOKLET ON OTHER ECONOMIC GARAGE EQUIPMENT.

### Special Offer-Combination Set

No. 2 Little Giant

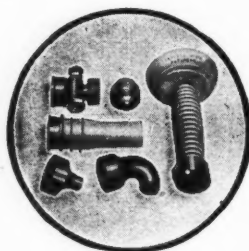
Sponge Washer

Rubber Nozzle

Spout Nozzle

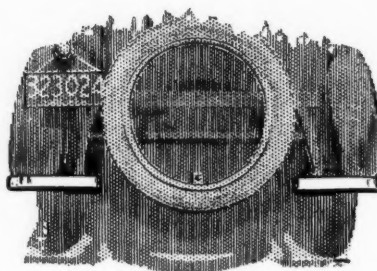
Spray Nozzle

Curved Nozzle



\$6.25 Value for \$5.00, less dealers' discount.

**THE GAYLORD MFG. CO.**  
Paterson, New Jersey



**Fendagards sell on sight! . . . . .**

They appeal instantly to the motorist who can see at once that Fendagards alone furnish full protection—with none of the disadvantages of the projecting type of rear bumper.

**And the \$8 Selling Price clinches the sale . . . . .**

You can handle Fendagards with no trouble at all. They fit ALL cars having semi-elliptic springs—no extra parts or special fittings to carry in stock! Wire your jobber today.

**Fendagard Sales Corp.**

Springfield

Mass.

**Fendagard**  
PATENTED SEPT. 4, 1923

Rear-end "Protection without projection"





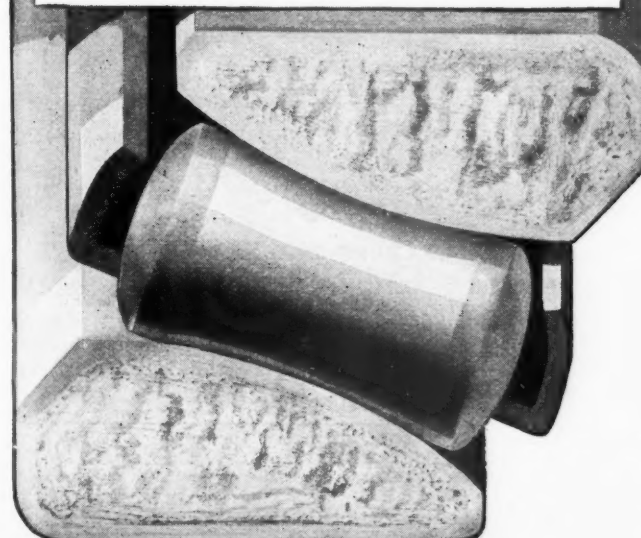
## SHAFER

**Self-Aligning ROLLER BEARING**  
PAT. & PATS. PENDING

Shafer Roller Bearings are manufactured from highest grade alloy steel, scientifically heat treated and ground to accurate dimensions. Properly installed and adjusted they are guaranteed to give satisfactory service.

*Distributors in all  
principal cities*

**SHAHER BEARING CORPORATION**  
6501 WEST GRAND AVENUE  
CHICAGO, ILL.



*Fahnestock Spring  
Clip Binding Posts on  
Columbia Ignitor at  
no extra cost to you.*



## Columbia Batteries

for the Great Outdoors

**N**OW is the time when field and stream, seashore and mountain top hear again gas engines that have been silent during the winter. Ford trucks, water pumps, motor boats, bells, buzzers, lights, and a thousand and one devices are coming to renewed life at the command of Columbia Battery energy.

This is the time when the dealer pushes Columbias and watches his sales jump. Display Columbias in windows and on counters. Keep your stock handy. Lots of people will say, "Give me a dry cell," expecting you to give them a Columbia. Don't disappoint them. Columbia Dry Batteries—the quickest and easiest to sell. The batteries that made the dry cell popular. It pays to sell Columbia Dry Batteries.

Ask your jobber.

*Manufactured and guaranteed by*

**NATIONAL CARBON COMPANY,  
Inc.**

New York

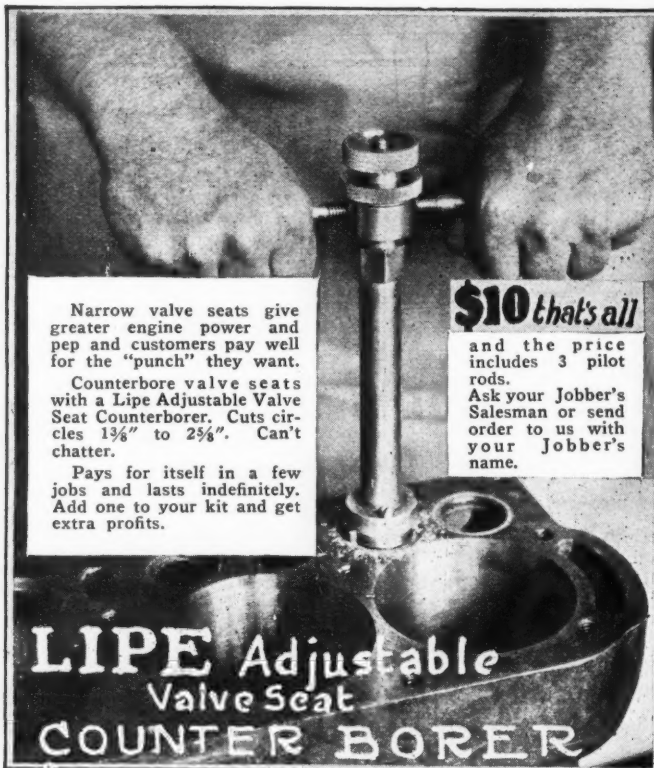
San Francisco

Canadian National Carbon Company, Limited, Toronto, Ontario

# Columbia Dry Batteries

*—they last longer*

## A REAL SHOP TOOL



Narrow valve seats give greater engine power and pep and customers pay well for the "punch" they want.

Counterbore valve seats with a LIPE Adjustable Valve Seat Counterborer. Cuts circles  $1\frac{1}{4}$ " to  $2\frac{3}{8}$ ". Can't chatter.

Pays for itself in a few jobs and lasts indefinitely. Add one to your kit and get extra profits.

**\$10 that's all**  
and the price includes 3 pilot rods.  
Ask your Jobber's Salesman or send order to us with your Jobber's name.

**LIPE Adjustable Valve Seat COUNTER BORER**

**R. N. ROACH COMPANY**  
RIALTO BLDG. SAN FRANCISCO, CAL.



**60,000 Sold in six months**

**MINUTE METER \$2.50**

The Lux Clock Mfg. Co., Waterbury, Conn., U.S.A.

**The Cash Register is the Alarm and it r-r-rings very often!**

Sales on this low-priced, dependable automobile clock keep the cash-register ringing—Proof? 60,000 Minute Meters Sold in six months, the first six months of its existence!

And the Minute-Meter Stays Sold—its ability to tick the minutes off "to the minute" day in and day out is the reason. Convenient, too, a turn of the knob, shown in illustration and the Minute Meter lifts out for rewinding or setting. A handsome reliable little instrument with a display stand that shows it off to advantage.

The Minute Meter fits flush on any dash of any thickness, wood or steel. Neatly packed in individual cartons. Attractive display stand as shown above with each dozen! Orders shipped promptly!

**The LUX CLOCK MANUFACTURING CO., INC.**  
Waterbury - Connecticut - U.S.A.



**Minute Meter Dash Cutter**

**Added Profit in Installation**

Add 50 cents to the price for installation! With the Dash Cutter the Minute Meter can be put on a wood back instrument board in about 15 minutes—10 minutes for all-steel boards! Complete, ready for use, \$1.00. Two installations and the cutter is paid for.



## Who Makes the Insulation of the Spark Plugs You Buy?

Consider for a moment the importance of an insulator to a spark plug. If the insulator fails, as it often does, the spark plug's usefulness is ended. So look to the insulation when you buy spark plugs.

Be certain that the insulator will withstand all sorts of abuse and have that "Heating-resisting" efficiency so essential to long-lived spark plugs. If you want to be sure of these qualities—

Look for "775" on the insulator. It is scientifically manufactured to resist heat and give great strength. The practical proof for this remarkable goodness lies in the fact that most of the better spark plug manufacturers use "775."

**FRENCHTOWN PORCELAIN CO.**  
Trenton, New Jersey  
"Established in 1910—Busy Ever Since"

**775**  
100% tested

## Spark Plug Insulation

**Every day you are losing profit**

Those lifting jobs that call men away from their assignment are wasters.




One man with a Canton Crane can lift more in less time than five men without one. And there are a score of other jobs, mechanics have found, where the Canton is handy and time-saving.

Write for the booklet MA illustrated. It is a complete catalog of Canton Cranes giving sizes and prices. No obligation—just a line to—

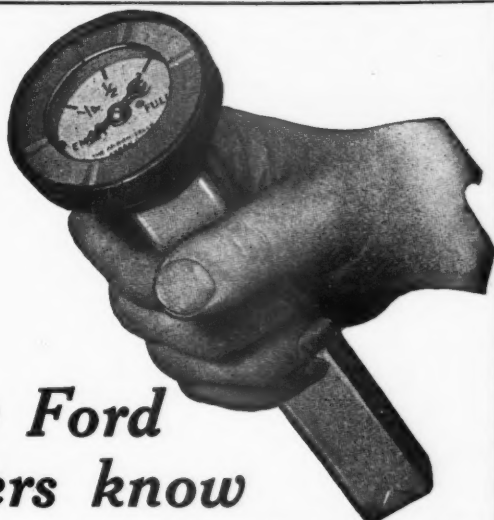
**The Canton Foundry & Machine Co.**  
Canton, Ohio  
New York Office, 203 East 15th Street

# CANTON

**PORTABLE CRANE & HOIST**



## Only Ford owners know



To the man who does not drive a Ford it seems a simple matter to make the eight moves required to measure the gas. But only Ford owners know how convenient it is to be able to know the supply at a glance.

Tasco Gauges are just what these owners want. A convenient, sturdily built gauge selling at a low price—\$1.25. Owners in your vicinity will recognize their adaptability for the job at a glance.

Sell Tasco Gauges—at the counter, in the window and at the pump. They pay big.

Write today for the discounts.

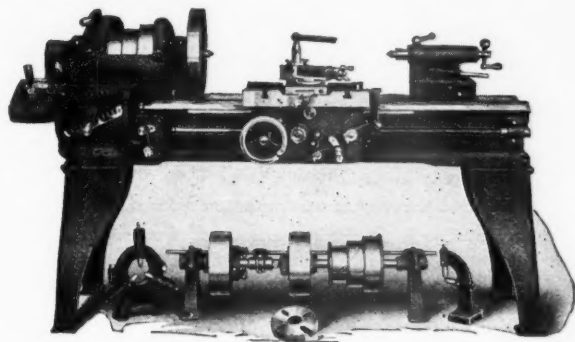
Please name your jobber.

The Akron-Selle Co. Akron, Ohio  
"40 years in business"

# TASCO

## C-J Profit Producing Lathes

Are Pioneers in their field, being the first modern Lathes to be adopted generally in auto service stations. A standard make, one of the oldest in the field, backed by many years successful service. Known and in use the world over.



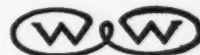
13 inch; 15 inch; and 16 inch swing Quick Change Gear or Semi Quick Change Gear. **ACCURATE; DURABLE; SIMPLE TO OPERATE.**

Every worthwhile feature but not one superfluous feature is embodied in these quality Lathes.

**HONESTLY BUILT HONESTLY PRICED**

Write today for Special Garage Bulletin "M.A."

**The Carroll-Jamieson Machine Tool Company**  
Batavia, Ohio.



# "IDEAL"

Assortment of

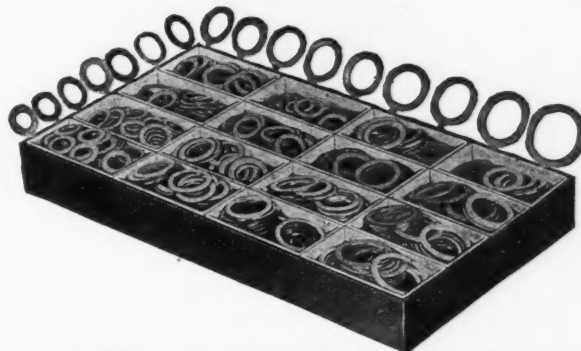
## COTTER PINS

The standard assortment of Cotter Pins for general auto requirements—packed in a practical size, round screw-top box, attractively and fully labeled. Containing 100 assorted Cotters ranging from 1/16x1/2" to 5/32"x1 1/2"—being all the essential auto sizes. Just the thing for the shop or Counter Sales.

We also make the well known W. W. Assortment in Leatherette covered cases as well as assortments for Agricultural Implements and Hardware requirements. We manufacture all sizes of Cotter Pins.

Ask your jobber for the W. W. line

**WESTERN WIRE PRODUCTS COMPANY**  
St. Louis, Mo.



## 850 Steel Spacing Washers

17 sizes—50 of each size per box. Inside diameters from 3/8 to 1 inch, .015 thick. This assortment made for adjusting end play in all makes and types of starting motors and generators. Largest washer illustrated made to go in the front end plate of Ford generator. Lateral motion thus adjusted without removing bearing from armature shaft.

Mailed, post paid, per box, \$3.50.

If not handled by your jobber, order from us.

Any size or sizes used, can be replaced.

**ARMATURES:** We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.  
**FORD GENERATOR AND MOTOR ARMATURES** ..... \$ 1.50  
**ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES** ..... 5.00  
**SINGLE UNIT MOTOR GENERATOR ARMATURES** ..... 10.00  
**MAGNETO ARMATURES** ..... \$3.75 to \$4.75

**Armature Rewinding Co., Inc.**

3301 Washington Blvd., St. Louis, Mo.

## UNITED STATES Portable Electric DRILLS.



THE power saving alone, thru the use of U. S. Portable Electric Drills, will give you more profit on servicing jobs that require drilling operations. "The good mechanic knows!" Send for catalog 21 C. Ask your jobber to show you the U. S. line.

THE UNITED STATES  
ELECTRICAL TOOL CO.  
CINCINNATI, OHIO

District Sales Offices and Service Stations  
Boston Detroit New York  
Buffalo Houston Philadelphia  
Chicago Indianapolis Pittsburgh  
Cleveland Kansas City St. Louis  
Columbus Milwaukee Toledo  
Minneapolis

Complete stocks carried in all Service Stations

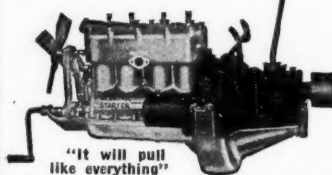


## MORE POWER

Replaces the regular Ford **Transmission**  
**SIMPLEX 3 SPEED**  
Sliding Gear Type

For Ford Cars and Trucks

26 to 1 in low in our new type "CT"

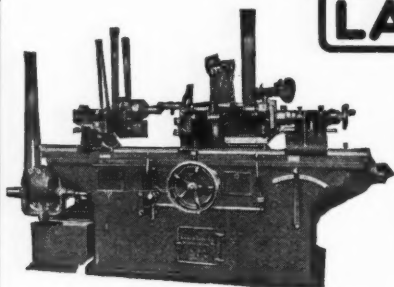


"It will pull like everything"

Have three speeds forward and one reverse, replacing the regular Ford transmission—drums, bands and all. The low speed is lower than the Ford, therefore, more power—the third is the same as the Ford and the second is half way between. It's ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jackshaft outside of case. Hyatt Roller and Genelite bearings. No cutting or machining—installation easy.

E. D. & A. F. CRONK, Inc., 140 Hotel St., Utica, N. Y.

## LANDIS

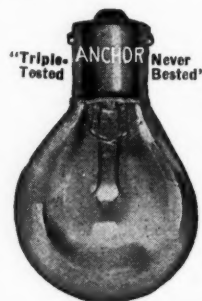


The LANDIS 4-A Special GARAGE Grinding Machine is built ESPECIALLY for repair shop work. You don't need a manufacturing machine—don't get one. The 4-A Special is perfect for repair shops. Quick and easy change from job to job. Simple to operate. ACCURATE. Built by world's largest makers of grinding machines. More value for your money. Catalog.

**Landis Tool Co., Waynesboro, Pa.**

New York Office—30 Church St.

## EXCESSIVE VIBRATION



"Triple-Tested" "ANCHOR" "Never Bested"

is death to many a bulb, but not to Anchors.

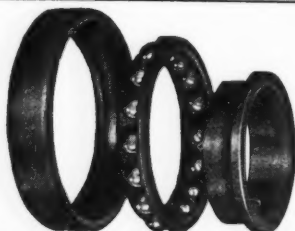
The filament used in Anchor Auto Bulbs, is chemically treated, so that it will withstand continuous shocks—radical changes of temperature and give the user an adequate return for his money.

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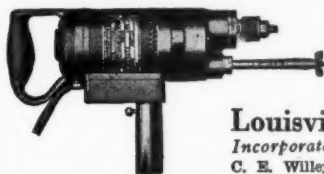
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### Electric Drill and Valve Grinder

Greatest time and money saver,  
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A complete substitute for dangerous acids,  
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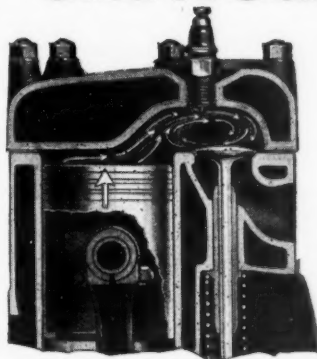
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All that science and skill could  
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It represents a distinct revision  
in combustion chamber design  
that provides wide improvement  
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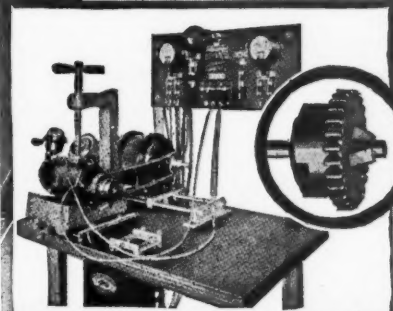
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With a Simplicity you can regrind cylinders  
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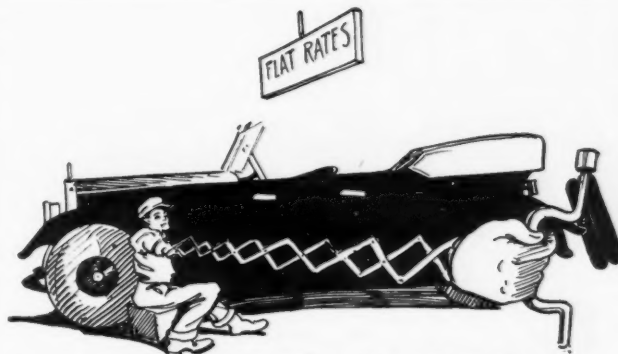
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Nature failed to provide man with an "all round the  
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The H & G 140 Universal Wrench Set, always at  
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With his H & G Wrench Set, 140 different combina-  
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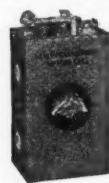
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One-day service. Dealers find our agency profitable.

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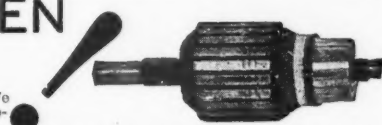
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Isolators  
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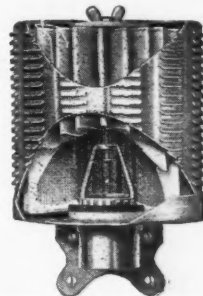
are adding to their profits and increasing the satisfaction of those who drive their cars by installing Protectomotors on every car sold.

More than an air cleaner Protectomotor regulates air temperature and muffles carburetor noises.

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Filters all dust, sand and grit out of air supply to carburetor and motor. Requires no cleaning or other attention.



See the

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Pages 116 and 117

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Patented

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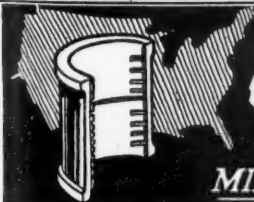
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Valves Exclusively for over 9 Years



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The Double Lock for Spare Tire  
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100% efficient. Requires no key for locking.  
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The oldest standard  
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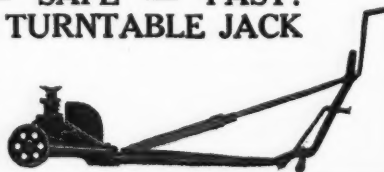
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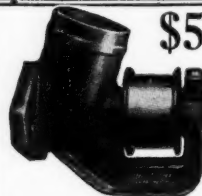
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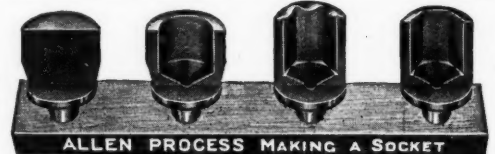
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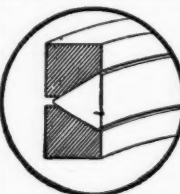
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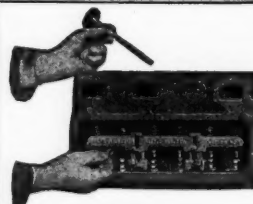


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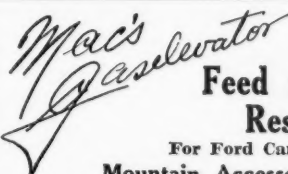


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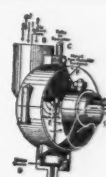
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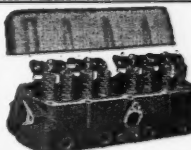
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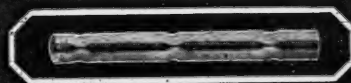
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American Hammered Piston Ring Company  
Baltimore, Maryland

Write ~ and find out how  
**WATSON  
STABILATORS**

Change the Whole Nature of Your Car

JOHN WARREN WATSON CO., 24th &amp; Locust Sts., PHILADELPHIA

**LINENDOLL EXHAUST HEATER**

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.  
Norwalk, Ohio



**EATON**  
**BUMPERS**



**\$17.50 COLONIAL CYLINDER HONES \$17.50**  
**PRICES REDUCED ONE HALF**

You can now buy the Colonial Cylinder Hone, an approved tool for this class of work and one of the best Hones on the market at \$17.50 each F. O. B. Kalamazoo. Made in three sizes, one, two and three, No. 1 2 3/4" to 3 1/4", No. 2 3 1/4" to 3 3/4" bore, No. 3 3 3/4" to 4 1/4".

Colonial Cylinder Hones are now being used by some of the best factory Service Stations in the country as well as by numerous Service Station Owners.

Colonial Gear & Manufacturing Co., Kalamazoo, Mich.

## TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



Pat'd 7-22-'22

THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

**ADJUSTABLE BEARING CO., Inc.**  
Dept. M. Brazil, Indiana



# Battery Plates

**CONTINENTAL BATTERY CO.,**  
3201 Papin St., St. Louis, Mo.



Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guaranteed Satisfactory Attaching Arms for all Leading Makes of Cars.

We invite comparison in appearance, quality and price.

THE BELLEVUE MANUFACTURING CO., Bellevue, Ohio

# Jacobs ROAD-LITE

Lights the way to safety

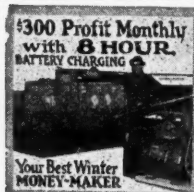
Lights up the right hand side of road 60 to 70 feet ahead. Can't shine in other fellow's eyes. Invaluable for night driving.

Jacobs Auto Safety Lamp Co., Blacksburg, Va.

**Hycor**  
**Brake Lining**  
FOLDED AND STITCHED  
HYDRAULIC COMPRESSED

Millions of feet annually installed as factory equipment

THE MANHATTAN  
RUBBER MFG. CO.  
PASSAIC, N.J.



\$300 Profit Monthly  
with 8 HOUR  
BATTERY CHARGING

Your Best Winter  
MONEY-MAKER

## MAKE BIG MONEY Charging Batteries

Small cash payment brings you HB 8 hour charging outfit. Easy terms of only \$20 monthly; let your profits pay balance with nice surplus besides. Thirty day free trial on money back guarantee lets you try HB outfit at our risk. HB patented voltage-regulating winding absolutely prevents reversing. Saves current. Start now to make big profits with HB 8 Hour battery charger. Write today for information.

HOBERT BROS. CO., Box AR 724, TROY, OHIO



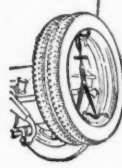
## \$700 Profit in One Month

That's what one distributor made. He's only one of many doing a big business. Dealers, too, are making sales by the dozens. Few accessories in recent years have been as popular as the

**DUPLIX**

Second Spare Tire Carrier & Rim Tool Carries spare tire—also expands and contracts rim when changing tires. Two tools for the price of one. Write for details.

TRIPP-SECORD & CO.  
606 Kerr Bldg., Detroit, Mich.



# JOHNSON Gas Appliances

Metal-Melting Soldering Heat-Treating

**JOHNSON GAS APPLIANCE CO.**  
Cedar Rapids, Iowa

Pacific Coast Repr., C. B. Babcock Co., San Francisco, Calif.  
New York Office—277 Lafayette St.

Write for Free  
Catalog No. 31

Styles For All Cars

**Gemco**  
**BUMPERS**

Special Process Tempered  
Greater Cushioning Resiliency

**GEMCO MFG. CO.**  
742 So. Pierce St. Milwaukee, Wis.





## USE THE AMMCO

### Cylinder Re-Conditioning Tool

Regrinds and refinishes cylinder bores. It is self-adjusting, self-aligning and self-centering. Write for Bulletin.

Automotive Maintenance Machinery Company  
551 W. Washington St. Chicago

**\$2.00**  
Retail  
East of  
Rockies

## Life Timer for Fords

Needs no oil. Short proof. Fool proof. Wipes a perfect contact regardless of wobble in the shaft. Bakelite Commutator is reversible, giving 2 timers for the price of one. Sold through the jobber. Write for folder and discounts.

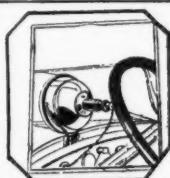
Mechanical Production Co.  
MILWAUKEE, WIS., U. S. A.

# WEL-EVER

## "OIL CONTROL" PISTON RINGS

The Motor Necessity That Has Made Good  
Backed by Seven Years' Satisfactory Service

THE WEL-EVER PISTON RING CO., TOLEDO, OHIO  
Sold most everywhere. If your dealer cannot supply you write us.



## INSHIELD DRIVING LIGHTS

INSIDE THE WINDSHIELD—NO GLASS TO CUT

INSHIELD 8 4 1/2 in. diameter. Heavy Nickel or Black Enamel. Made of heavy sheet brass. 21 c. p. Mazda precision type tipless bulb, silver, triple-plated reflector \$7.50	INSHIELD SENIOR 5 1/2 in. diameter. Nickel finish only. Simplest and best inner-controlled driv- ing light made. \$10.00
--	--

Patented Oct. 30, 1923

The Inshield Products Co., Toledo, Ohio  
Formerly the Thal & Bitter Machine Co.

## WAYNE CYLINDER REBORING MACHINE & VALVE GRINDER

WAYNE TOOL MFG. CO., WAYNESBORO, PA.

Be equipped with these  
two efficient machines to  
render good service on cyl-  
inder reboring and valve  
grinding jobs.  
Save time and labor and  
get more profit.

Write for details.



## RED GIANT RIM TOOL

The name "RED GIANT" is a guarantee  
of satisfaction. Known and used in the ma-  
jority of the civilized world. If your jobber  
cannot supply you write direct.

RED GIANT TOOL CORP.  
Lynchburg, Va.

## Johns-Manville ASBESTOS BRAKE LINING



## Lorentzen Headlight Kontrol

AN AUTOMOTIVE  
NECESSITY THAT SELLS

LORENTZEN HEADLIGHT KONTROL, INC.  
60 Grand St. New York City.

The new Columbia selling agreement incorporates those  
features interesting to successful dealers. You are invited  
to investigate.

## COLUMBIA MOTORS CO.

Address Dept. "B" Detroit, Mich.

## WATERVLIT SPIRAL EXPANSION ALIGNING REAMERS

Assure per-  
fect fitting pis-  
ton pins. Sizes for  
all bushings.

With self-cutting front pilot. True  
aligning. Expand accurately. Cut  
smoothly and stay sharp.

Will Not Chatter

Ask Your Jobber or Write for Literature

WATERVLIT TOOL CO., Inc.

1037 Broadway

Albany, N. Y.

## Do Motor Re-conditioning and Earn Big Money!

You can ream and hone an aver-  
age cylinder bloc the factory way  
in fifty minutes. Do the work  
without removing the engine,  
quickly, efficiently and econom-  
ically.

All you need is

## FOSTER-JOHNSON

Cylinder Reamers and Hones

Write for Foster-Johnson Station  
Manual and Tool Catalog

Foster-Johnson Reamer Co.  
1304 Beardsley Ave., Elkhart, Ind.

# PARAFLECTOR

At last—a headlight reflector that makes night driving safe.  
Write for full details.

The PARAFLECTOR CO., Minneapolis

## NO-LEAK-O PISTON RINGS

Won't Leak Because They're Sealed With Oil



No-Leak-O Piston Rings are making money for  
dealers everywhere. Their "oilSEALing" groove—  
found only in No-Leak-O—packs an oil film in  
between piston and cylinder walls like "packing"  
in a pump. Oil and gas stay where they belong.  
National advertising is helping the dealer sell  
No-Leak-O.

It will pay you to stock No-Leak-O at once.

Price 35c and up

NO-LEAK-O PISTON RING CO., Dept. 376, Muskegon, Mich.

## "The Best-Equipped Shop Gets the Business"



## DOUBLE YOUR FORD SELLING FIELD And Make Two Profits with

# Warford

AUXILIARY TRANSMISSION

Two-Ton Capacity—High Speed

Ask your nearest distributor to demonstrate it or write us.

THE WARFORD CORP., 44 Whitehall Street, New York



## BATTERY SERVICE EQUIPMENT!

UNITRON  
Rectifier

PORTOSTAT  
Test Set

FOREST ELECTRIC COMPANY

New and Wilsey Streets

NEWARK, N. J.

# The Broadcaster

A Department that will Find What You Want

If you don't find what you want here,  
your advertisement here will find it  
for you

This Broadcaster Department serves a real purpose in the industry by affording a central clearing house for all kinds of business wants. It will help you to get a position or secure competent assistants or executives; get agents or agencies, representatives or accounts. It will find a partner or financial backing. It will secure more business for you or sell your business at a fair price. It will help you to dispose of dead or slow-moving stock, sell equipment or machinery you no longer need, or it will find a new plant or factory for you. It is of special value for auction notices, the sale of books, patents, parts, industrial sites and business opportunities of all kinds. This advertising is the opportunity advertising of the industry. It is inexpensive, quick-acting, result-producing. Have you tried it?

## PARTS and REPAIRS

### DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS

LAMMERT & MANN CO.  
Cylinder and Crankshaft Grinding  
215-21 N. Wood St. CHICAGO Phone West 4918

### JANSEN FLY WHEEL GEAR RINGS

Chevrolet 490.....\$3.00  
Chalmers ..... 4.00

JANSEN MACHINE COMPANY  
Des Moines, Iowa

### NEW AND USED AUTO PARTS

We have wrecked over a  
thousand cars.

SANDER BROS. AUTO WRECKING CO.  
WEST POINT, IOWA

### AUTO PARTS

SAVE 50% TO 75% ON ALL CARS  
New and Used Gears—Springs and Axles—Cylinders—  
Motors—Rear Systems, etc. Wire or Write  
INDIANA AUTO PARTS CO.  
318-18 NO. ILLINOIS ST., INDIANAPOLIS, IND.  
LARGEST CAR WRECKERS IN INDIANA

### AUTO Save 50 — 80% PARTS

NEW AND USED GEARS, AXLES, BEARINGS,  
SPRINGS, MAGNETOS, GENERATORS, ETC. JOB-  
BERS IN BANKRUPT AUTO SUPPLIES.

BRIGHTMAN AUTO EXCHANGE  
321 Windsor Ave. HARTFORD, CONN.

## INFORMATION

Six cents a word is the rate for all undisputed advertisements set solid, regular want ad style; all capitals, 9c. a word; all capitals leaded, 12c. a word; minimum charge \$1 an insertion; payable in advance (see next paragraph).

Ten per cent discount if one payment is made in advance for four or more consecutive insertions. Advertisements other than "Positions Wanted" will be billed monthly if run more than four times.

Add five words for address if replies are to come to a box number address at any of our offices. These replies are forwarded each day as received, in new envelopes, at no extra charge.

Refund will be made if all insertions ordered are not needed, the amount refunded being the difference between cost of insertions given and full amount paid.

Telephone orders must be confirmed in writing same day. No allowances can be made for errors of any kind unless prompt notification is sent us.

When replying to blind ads be careful to put on your envelope the correct box number and do not enclose original letters of recommendation—send copies.

Displayed advertisements are sold by the inch. Rates will be furnished upon application.

The right is reserved to refuse any advertisement and also to rewrite and edit copy furnished whenever the publishers consider it advisable to do this.

THE BROADCASTER DEPARTMENT

THE CLASS JOURNAL COMPANY

239 W. 39th St., New York  
5 S. Wabash Ave., Chicago

## PARTS and REPAIRS

ANY PART  
for  
ANY CAR  
NEW  
or  
USED

Send for Catalogue  
Cincinnati Auto Parts  
& Wrecking Co.  
712-714 Walnut St.  
CINCINNATI, OHIO  
Parts our middle name

## PARTS and REPAIRS

PARTS FOR AUTOS AND TRUCKS  
WHAT DO YOU NEED? We have M. Gray's Auto  
Parts Company, 3212 Brighton Road, Pittsburgh, Pa.

## PATENTS and PATENT ATTORNEYS

Attorney-at-Law and Solicitor of Patents  
C. L. PARKER

Formerly Member Examining Corps., United  
States Patent Office

American and foreign Patents secured. Searches made  
to determine patentability and validity. Patent suits  
conducted. Pamphlet of instruction sent upon request.  
McGill Building, WASHINGTON, D. C.

## PATENTS

BOOKLET FREE HIGHEST REFERENCES  
PROMPTNESS ASSURED BEST RESULTS  
Send drawing or model for examination  
and report as to patentability  
WATSON E. COLEMAN, Patent Lawyer  
644 G Street, N. W., Washington, D. C.

## MISCELLANEOUS

### IMPROVE

Your business standing and prestige  
by using Quality

### LITHOGRAPHED STATIONERY

Our special combination plan of operation makes  
it possible for us to furnish you fine Lithographed  
Stationery produced on a White 20 lb. Watermarked  
Bond in quantities as low as 2000 and up.

### AT LESS THAN PRINTING PRICES

### ENGRAVED HEADING FREE

Made up in anyone of the many beautiful and  
original designs we feature.  
You must see our samples to appreciate what we  
are offering you.

Send for Samples and Full List of Prices  
Just a few of our prices on 8 1/2 x 11 letterheads or  
6 1/2 envelopes for comparison.

4M	12M	50M	100M
\$5.95	\$3.50	\$2.25	\$2.10
per M	per M	per M	per M

Your Repeat Order Will Cost You Less  
PEERLESS LITHOGRAPHING CO.  
1821-23 Beretan Ave. Chicago, Ill.

FOR SALE: Garage in live town near Quincy, Ill. Exclu-  
sive Ford Agency. Doing good business. Hundred twenty-  
five car contract. Ill health reason for selling. No trades.  
Address Box 162, Quincy, Ill.



PARTS and REPAIRS

**The Broadcaster**

PARTS and REPAIRS

NEW

**AUTO PARTS**

USED

*The Largest Stock of New and Used Car and Truck Parts in the World. We Have Everything. Write Us.*

**New Motors**

Continental Red Seal 4N, 3 $\frac{3}{4}$ x5.....\$250.00  
Herschell Spillman, 4 Cyl., Model 7000, 3 $\frac{3}{4}$ x5..... 125.00  
Buda, 4 Cyl., Model R, 3 $\frac{3}{4}$ x5..... 150.00  
Lycoming, 4 Cyl., Type K, 3 $\frac{3}{4}$ x5.... 65.00

**New Clutches**

Borg & Beck, Type DX, 12".....\$18.00  
Borg & Beck, Type DX, 10"..... 8.00  
Hoosier, 10"..... 7.50

**Starters, Generators and Magnetos**

New and Used, for All Cars and Trucks

**Universal Joints**

New and Used, for All Cars and TRUCKS

**Radiators**

New and Used, for All Cars and Trucks

**WHEELS**

New and Used, Wood, Disc, Wire and Steel, for All Cars and Trucks

**SPECIAL**

Budd Wire Wheels, New Type, 32x4. Will Fit Oakland 34C, Paige 6-44, and Other Cars....\$8.00 Each  
**Set of Five \$37.50**

**NEW GEARS**

For All Cars at 33 1-3% to 50% Off List

*Telephone, Telegraph or Write Your Order*

*Always Mention Model and Serial Number of Car or Truck  
Immediate Shipment Guaranteed*

**SPECIAL**

**FORD CUSHIONS. FRONT AND REAR. TO FIT 1921-2-3**

**\$2.85 Each**

**New Carburetors**

Zenith HP5A .....\$15.00  
Zenith O4 ..... 7.50  
Zenith T4 ..... 7.50  
Stromberg  $\frac{3}{4}$  ..... 4.90  
Stromberg LB1 ..... 12.50  
Stromberg M1 ..... 9.00  
Stromberg M2 ..... 11.75  
Stromberg O2 ..... 14.50  
Rayfield L3P ..... 11.50  
Rayfield MR3V ..... 9.75

**25% Deposit Required  
With All Out of Town  
Orders**

**DOUGLAS AUTO PARTS CO., Inc.**

*HOUSE OF A MILLION PARTS*

2003-5-7-9 So. State St. Dept. P Phone Calumet 7174-7175 Chicago, Ill.

**MISCELLANEOUS****FOR SALE**

**SPECIALTY AUTO JACK** for Ford and light cars, with many unique and attractive selling features, including patents, tools, dies and equipment complete for manufacture. Good business and distributing connections already established. Would make a splendid addition to accessory line already on sustaining basis. For full particulars, address MANUFACTURER, Box 6146, c/o Motor AGE, 5 So. Wabash Av., Chicago, Ill.

**MISCELLANEOUS**

**FOR SALE**—Old established automobile business in an Iowa city of 8,000. Chevrolet Agency. 1923 sales over 175 cars. Fine showroom. Located on two main highways with over 100 miles of paved road. Battery station and paint shop in connection. Good reason for selling. Address Box 6148, care of MOTOR AGE, 5 S. Wabash Ave., Chicago, Ill.

**FOR RENT**

Old established paint shop in city 90,000, second floor, 139 ft. long 48 wide. Varnish room partitioned off. Elevator, light, heat and water furnished. Situated two squares from court house. **SINGLE CENTER BUGGY COMPANY, Evansville, Indiana.**

**FOR SALE**

Fifty Car Garage, Brick and Tile. Doing good business. On Main highway, between Hornell and Olean, New York. Address Box 6150, care of MOTOR AGE, 5 S. Wabash Ave., Chicago, Illinois.

**BATTERY CARRIER**—Most simple, efficient made. Two by parcel post, \$1.15. Horace D. Shields, R. R. No. 3, Grand Rapids, Michigan.

Vulcanizing and Tire Repair Plant at sacrifice price for quick cash sale. Fastus Bros., 1321 So. Oakley, Chicago.

**HELP WANTED****District Distributors—Agents**

Make big money with Radiolite, marvelous battery electrolyte. Better and quicker than expensive 8-hour charging system. Removes and prevents sulphation in auto and radio batteries, makes frequent recharging unnecessary. Preserves plates and prolongs life of any battery. Great opportunity for live dealers. Radiolite is the original product and is protected by U. S. and foreign patents. Gallon free for testing.

**RADIOLITE CO., St. Paul, Minn.**

An old established concern producing automobile lighting equipment in all forms desires manufacturers agents to sell jobbing trade. None considered unless names of concerns now representing are given along with territory covered and method of operating. Address Box E 6151, care of MOTOR AGE, 5 S. Wabash Ave., Chicago, Illinois

**SALESMEN** desiring several light, ready sellers, good profit. Write for information. Appeals to dealers, garages, battery houses, service stations, Ford mechanics. C. M. McCord, 3301 Washington St., St. Louis, Mo.

**WANTED**—Sales Representative to handle our exclusive line of Automotive tools and equipment. The Specialties Co., 410 E. Virginia Ave., Denver, Colo.

If you need good men in your business  
If you are looking for a better position  
If you want to buy or sell used machinery

**The Broadcaster Department  
will help you**

# "NORMA"

BALL BEARINGS



THE NORMA COMPANY OF AMERICA  
ANABLE AVE., LONG ISLAND CITY, N.Y.

**How Much Will  
You Let It  
Save You?**

For extreme temperatures use  
Tanpac Compressed Asbestos Sheet  
Packing; for all other automo-  
tive and power requirements use  
Tanpac Fibre sheet — a new  
favorite and one that promises  
to equal in popularity our famous  
Tenax sheet. "Tough as raw-  
hide," pliable, easy working.  
Will not rot or disintegrate in  
service.

Rolls 36 inches wide or sheets.  
Thickness 1-64, .020, 1-32 and  
1-16 inch.

Buy Tanpac and let it start  
saving for you at once. For sale  
by leading jobbers.

Let us figure on your gaskets.  
Send blue prints.

**Advance Packing & Supply  
Company**  
808 Washington Blvd., Chicago  
Pacific Coast Distributor: Allied  
Industries Inc., San Francisco,  
Los Angeles, Seattle.

**TANPAC**

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## It's True!

### I just found out!

FOR years I've seen in ads that this PEP Water-Mixed grinding compound will grind a valve in four minutes and do a better grinding job than a grease-mixed compound will do in ten.

I certainly cheated myself when I put that down as advertising bunk. Sent in for a free sample the other day and found out for myself. Gee! What speed and quality!

Now I'm figuring out how many hours I wasted by not trying PEP years ago.

You've got a surprise coming if you take my tip and risk a stamp to send in this coupon for a free sample.

MAIL THIS COUPON NOW. DON'T PUT IT OFF.  
To PEP MFG. CO., Inc., 33 W. 42nd St., N. Y.  
Check free sample wanted  
Pep Valve Compound ☐  
Pep Bearing Compound ☐  
Write name and address in margin in pencil  
M.A. 6-26

# BALLOON TIRE WEEK

Kokomo Tire dealers everywhere will hold a "Balloon Tire Week (with our help) during the month of June.

This new and intensive selling plan, devised by the Kokomo organization, will boost balloon tire sales for every Kokomo merchant. It is just another example of our policy of co-operation with the dealer to increase retail sales.

Kokomo dealers are everywhere successful. Partly because our plan of dealer co-operation is successful. The biggest asset they have (next to the splendid quality of the tires themselves) is the fact that the whole Kokomo organization is back of every dealer all the time.

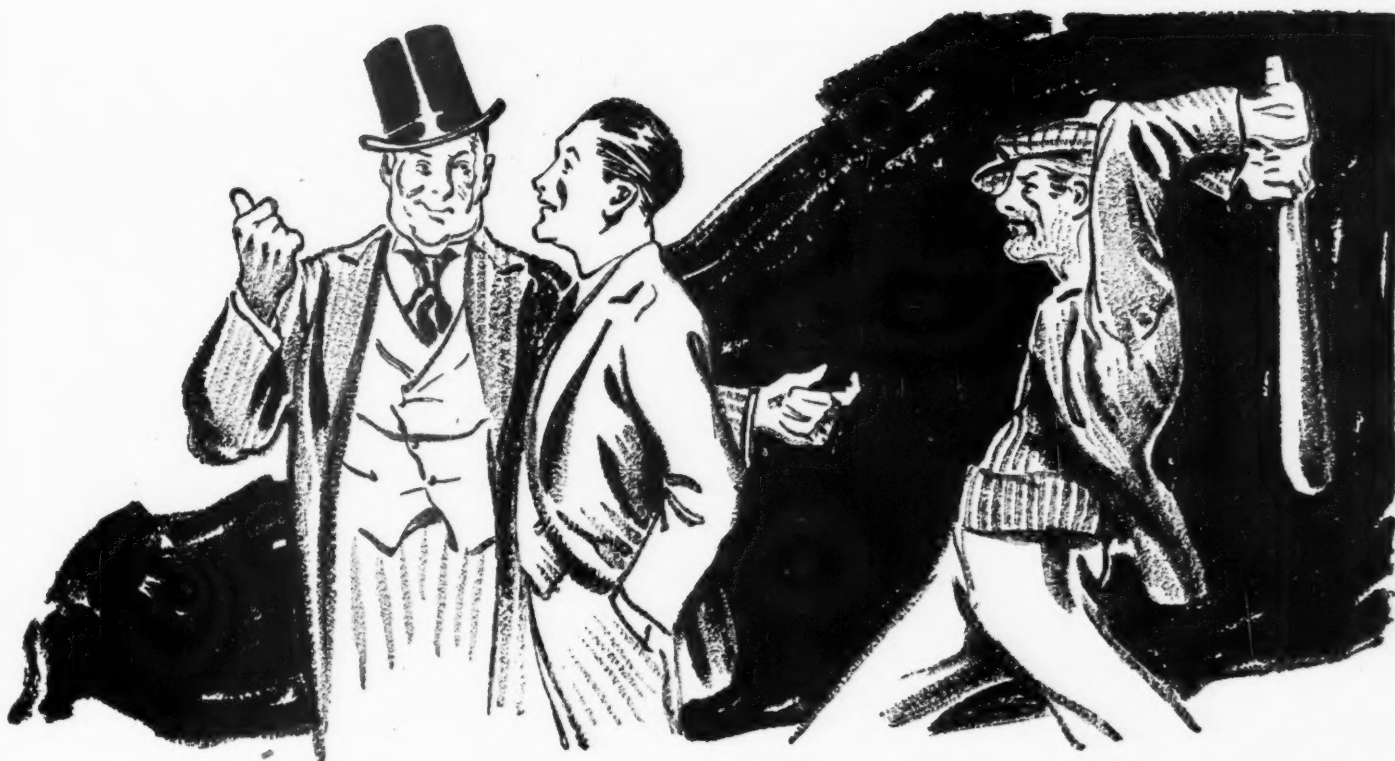
Write—and let us tell you how YOU can become one of these prosperous and satisfied tire merchants!

Kokomo Rubber Co., Kokomo, Indiana

LONG ~ LIFE  
**Kokomo**  
**Balloons**







# See the Pretty Birdie?

—and then, Blam!—a sad awakening.

Don't you make the mistake of letting your attention stray from the main issues in determining your possibilities as an automobile merchant.

Get down to brass tacks—and stay there. Let the birdies sing, if they have a mind to. That's their business.

Compare the Stutz franchise with any other. Consider what it means to be free of all burden and hazard of overstock and forced shipments the way business is today.

Investigate the new Stutz merchandising plan—one that absolutely guarantees the conservation of dealers' resources—the most liberal one of its kind offered by any company.

Build for the future by safeguarding your present investment. That's what a Stutz franchise assures. Write for information covering your territory. Our district men will be glad to call and explain our proposition in detail.



The Sign of

the Genuine

## From a Stutz Dealer's Letter

Dated May 14, 1924

"You certainly have a merchandising plan that is right and something the automobile manufacturer should have had before this. You are to be congratulated on pioneering this system of selling. It gives the dealer a chance to do business along lines that must succeed."

# STUTZ SIXES

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana

Builders of the Original and Genuine Stutz Motor Cars

# Gill

Piston Rings  50c & Pins

Special



50c



Servus

30c



## Take a Good Look at Them

Examine Gill, Special and Servus Piston Rings and the GILL Pin. You will be impressed by the fine workmanship that is easily noticeable. By micrometer testings you will find a degree of accuracy that can be reached only with the greatest care.

Quality products must be used in order to obtain maximum results. This explains why so many thousands of service men put their faith in GILL products.

The GILL line of piston rings is complete. Every requirement is covered by the three types—GILL Inter-locking-Joint Ring, Special Oil-Wiper Ring and Servus Step-Cut Ring. There is a GILL Pin for every engine—a complete line of standard and oversizes. Every GILL product is backed by the GILL reputation for satisfactory performance.

*Jobbers and dealers everywhere and GILL branches carry complete stocks.*

Prices above are up to and including 4 in.  
Write for price lists and specification books.

**GILL MANUFACTURING COMPANY**

8300 South Chicago Avenue, Chicago





